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*1st Session*

HOUSE OF REPRESENTATIVES

REPT. 107–134
Part 1

# NATIONAL MATHEMATICS AND SCIENCE PARTNERSHIPS ACT

JULY 11, 2001.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. BOEHLERT, from the Committee on Science, submitted the following

# R E P O R T

[To accompany H.R. 1858]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science, to whom was referred the bill (H.R. 1858) to make improvements in mathematics and science education, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

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89–006

The amendment is as follows:

Strike all after the enacting clause and insert the following:

**SECTION 1. SHORT TITLE.**

This Act may be cited as the "National Mathematics and Science Partnerships Act".

**SEC. 2. FINDINGS.**

The Congress finds the following:

(1) 12 years ago the President of the United States convened the Nation's Governors to establish common goals for the improvement of elementary and secondary education.

(2) Among the National Education Goals established was the goal that by the year 2000 United States students would be first in the world in mathematics and science achievement.

(3) Despite these goals, 8th graders in the United States showed just average performance in mathematics and science in the Third International Mathematics and Science Study-Repeat and demonstrated lower relative performance than the cohort of 4th graders 4 years earlier.

(4) The United States must redouble its efforts to provide all of its students with a world-class education in mathematics, science, engineering, and technology.

(5) The American economy has become the most robust in the world, not through state planning and government intervention, but through the hard work and innovation of its citizens. This success is founded in our Constitutional tradition of respect for individual liberty to pursue personal career objectives.

**SEC. 3. DEFINITIONS.**

In this Act—

(1) the term "Director" means the Director of the National Science Foundation;

(2) the term "institution of higher education" has the meaning given such term in section 101 of the Higher Education Act of 1965 (20 U.S.C. 1001);

(3) the term "eligible nonprofit organization" means a nonprofit research institute or a nonprofit professional association with demonstrated experience delivering mathematics or science education as determined by the Director;

(4) the term "local educational agency" has the meaning given such term in section 1401 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 8801(19));

(5) the term "State educational agency" has the meaning given such term in section 1401 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 8801);

(6) the term "elementary school" has the meaning given that term by section 14101(14) of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 8801(14)); and

(7) the term "secondary school" has the meaning given that term by section 14101(25) of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 8801(25)).

**SEC. 4. AUTHORIZATIONS OF APPROPRIATIONS.**

Any authorization of appropriations in this Act shall be considered to be in addition to amounts otherwise authorized or appropriated for the National Science Foundation.

**SEC. 5. MATCHING REQUIREMENTS.**

The Director may establish matching fund requirements for any programs authorized by this Act except those established in title IV.

# TITLE I—MATHEMATICS AND SCIENCE EDUCATION PARTNERSHIPS

## Subtitle A—Mathematics and Science Education Partnerships

**SEC. 101. PROGRAM AUTHORIZED.**

(a) IN GENERAL.—(1) The Director shall establish a program to award grants to institutions of higher education or eligible nonprofit organizations (or consortia thereof) to establish mathematics and science education partnership programs to improve the instruction of elementary and secondary science education.

(2) Grants shall be awarded under this section on a merit-reviewed competitive basis.

(b) PARTNERSHIPS.—(1) In order to be eligible to receive a grant under this section, an institution of higher education or eligible nonprofit organization (or consortium thereof) shall enter into a partnership with one or more local educational agencies that may also include a State educational agency or one or more businesses, or both.

(2) A participating institution of higher education shall include mathematics, science, or engineering departments in the programs carried out through a partnership under this subsection.

(c) USES OF FUNDS.—Grants awarded under this section shall be used for activities that draw upon the expertise of the partners to improve elementary or secondary education, or both, in mathematics or science, or both. Such activities may include—

(1) recruiting and preparing students for careers in elementary or secondary mathematics or science education;

(2) offering professional development programs, including summer or academic year institutes or workshops, designed to strengthen the capabilities of existing mathematics and science teachers;

(3) offering innovative programs that instruct teachers on using technology more effectively in teaching mathematics and science, including programs that recruit and train undergraduate and graduate students to provide technical support to teachers;

(4) developing distance learning programs for teachers or students, including developing courses, curricular materials and other resources for the in-service professional development of teachers that are made available to teachers through the Internet;

(5) offering teacher preparation and certification programs for professional mathematicians, scientists, and engineers who wish to begin a career in teaching;

(6) developing assessment tools to measure student mastery of content and cognitive skills;

(7) developing or adapting elementary and secondary school curricular materials, aligned to State standards, that incorporate contemporary research on the science of learning;

(8) developing undergraduate mathematics and science courses for education majors;

(9) using mathematicians, scientists, and engineers employed by private businesses to help recruit and train mathematics and science teachers;

(10) developing a cadre of master teachers who will promote reform and improvement in schools;

(11) developing and offering mathematics or science enrichment programs for students, including after-school and summer programs;

(12) providing research opportunities in business or academia for students and teachers;

(13) bringing mathematicians, scientists and engineers from business and academia into elementary and secondary school classrooms; and

(14) any other activities the Director determines will accomplish the goals of this section.

(d) SCIENCE ENRICHMENT PROGRAMS FOR GIRLS.—Activities carried out in accordance with subsections (c)(11) and (12) shall include elementary and secondary school programs to encourage the ongoing interest of girls in science, mathematics, engineering and technology and to prepare girls to pursue undergraduate and graduate degrees and careers in science, mathematics, engineering or technology. Funds made available through awards to partnerships for the purposes of this subsection may support programs for—

(1) encouraging girls to pursue studies in science, mathematics, engineering and technology and to major in such fields in postsecondary education;

(2) tutoring girls in science, mathematics, engineering and technology;

(3) providing mentors for girls in person and through the Internet to support such girls in pursuing studies in science, mathematics, engineering and technology;

(4) educating the parents of girls about the difficulties faced by girls to maintain an interest and desire to achieve in science, mathematics, engineering and technology, and enlisting the help of parents in overcoming these difficulties; and

(5) acquainting girls with careers in science, mathematics, engineering and technology and encouraging girls to plan for careers in such fields.

(e) RESEARCH IN SECONDARY SCHOOLS.—Activities carried out in accordance with subsection (c)(11) may include support for research projects performed by students at secondary schools. Uses of funds made available through awards to partnerships for purposes of this subsection may include—

(1) training secondary school mathematics and science teachers in the design of research projects for students;

(2) establishing a system for students and teachers involved in research projects funded under this section to exchange information about their projects and research results; and

(3) assessing the educational value of the student research projects by such means as tracking the academic performance and choice of academic majors of students conducting research.

(f) STIPENDS.—Grants awarded under this section may be used to provide stipends for teachers or students participating in training or research activities that would not be part of their typical classroom activities.

**SEC. 102. SELECTION PROCESS.**

(a) APPLICATION.—An institution of higher education or an eligible nonprofit organization (or a consortium thereof) seeking funding under section 101 shall submit an application to the Director at such time, in such manner, and containing such information as the Director may require. The application shall include, at a minimum—

(1) a description of the partnership and the role that each member will play in implementing the proposal;

(2) a description of each of the activities to be carried out, including—

(A) how such activities will be aligned with State and local standards and with other activities that promote student achievement in mathematics and science; and

(B) how such activities will be based on a review of relevant research, how such activities will encourage the interest of women and minorities in science, mathematics, engineering and technology and will help prepare women and minorities to pursue postsecondary studies in these fields, and why such activities are expected to improve student performance and strengthen the quality of mathematics and science instruction;

(3) a description of the number, size and nature of any stipends that will be provided to students or teachers and the reasons such stipends are needed;

(4) how the partnership will serve as a catalyst for reform of mathematics and science education programs; and

(5) how the partnership will assess its success.

(b) REVIEW OF APPLICATIONS.—In evaluating the applications submitted under subsection (a), the Director shall consider, at a minimum—

(1) the ability of the partnership to effectively carry out the proposed programs;

(2) the extent to which the members of the partnership are committed to making the partnership a central organizational focus;

(3) the degree to which activities carried out by the partnership are based on relevant research and likely to result in increased student achievement;

(4) the degree to which such activities are aligned with State or local standards; and

(5) the likelihood that the partnership will demonstrate activities that can be widely implemented as part of larger scale reform efforts.

(c) AWARDS.—(1) The Director shall ensure, to the extent practicable, that partnership grants be awarded under section 101 in a wide range of geographic areas and that the partnership program include rural, suburban, and urban local educational agencies.

(2) Not less than 50 percent of the partnerships funded under section 101 shall include businesses.

(3) The Director shall award grants under this subtitle for a period not to exceed 5 years.

**SEC. 103. ACCOUNTABILITY AND DISSEMINATION.**

(a) ASSESSMENT REQUIRED.—The Director shall evaluate the partnerships program established under section 101. At a minimum, such evaluations shall—

(1) use a common set of benchmarks and assessment tools to identify best practices and materials developed and demonstrated by the partnerships; and

(2) to the extent practicable, compare the effectiveness of practices and materials developed and demonstrated by the partnerships authorized under this subtitle with those of partnerships funded by other State or Federal agencies.

(b) DISSEMINATION OF RESULTS.—(1) The results of the evaluations required under subsection (a) shall be made available to the public, including through the National Science, Mathematics, Engineering, and Technology Education Digital Library, and shall be provided to the Committee on Science of the House of Representatives and the Committee on Health, Education, Labor, and Pensions and the Committee on Commerce, Science, and Transportation of the Senate.

(2) Materials developed under the program established under section 101 that are demonstrated to be effective shall be made available through the National Science, Mathematics, Engineering, and Technology Education Digital Library.

(c) ANNUAL MEETING.—The Director shall convene an annual meeting of the partnerships participating under this subtitle to foster greater national collaboration.

**SEC. 104. AUTHORIZATION OF APPROPRIATIONS.**

There are authorized to be appropriated to the National Science Foundation to carry out this subtitle $200,000,000 for each of fiscal years 2002 through 2006.

# Subtitle B—Teacher Research Scholarship Program

**SEC. 111. PROGRAM AUTHORIZED.**

(a) IN GENERAL.—(1) The Director shall establish a program to award grants to institutions of higher education or eligible nonprofit organizations (or consortia thereof) to provide research opportunities in mathematics, science, and engineering for elementary or secondary school teachers of mathematics or science. Such institutions of higher education or eligible nonprofit organizations may include one or more businesses or Federal or State laboratories as partners under the program.

(2) Grants shall be awarded under this section on a merit-reviewed competitive basis.

(b) PROGRAM COMPONENTS.—Grant recipients under this section—

(1) shall recruit and select teachers and provide such teachers with opportunities to conduct research in academic, business, or government laboratories;

(2) shall ensure that the teachers have mentors and other programming support to ensure that their research experience will contribute to their understanding of mathematics, science, and engineering and improve their performance in the classroom;

(3) shall provide teachers with a scholarship stipend; and

(4) may provide room and board for residential programs.

(c) USE OF FUNDS.—(1) Not more than 25 percent of the funds provided under a grant under this section may be used for programming support for teachers.

(2) The Director shall issue guidelines specifying the minimum and maximum amounts of stipends recipients may provide to teachers under this section.

(d) DURATION.—A teacher may participate in research under the program under this section for up to 1 calendar year or 2 sequential summers.

**SEC. 112. SELECTION PROCESS.**

(a) APPLICATION.—An institution of higher education or an eligible nonprofit organization (or a consortium thereof) seeking funding under section 111 shall submit an application to the Director at such time, in such manner, and containing such information as the Director may require. The application shall include, at a minimum—

(1) a description of the research opportunities that will be made available to elementary or secondary school teachers, or both, by the applicant;

(2) a description of how the applicant will recruit teachers to participate in the program and the criteria that will be used to select the participants;

(3) a description of the number, types, and amounts of the scholarships that the applicant intends to offer to participating teachers; and

(4) a description of the programming support that will be provided to participating teachers.

(b) REVIEW OF APPLICATIONS.—In evaluating the applications submitted under subsection (a), the Director shall consider, at a minimum—

(1) the ability of the applicant to effectively carry out the proposed program;

(2) the extent to which the applicant is committed to making the program a central organizational focus; and

(3) the likelihood that the research experiences and programming to be offered by the applicant will improve elementary and secondary education.

(c) AWARDS.—(1) The Director shall ensure, to the extent practicable, that grants be awarded under this subtitle in a wide range of geographic areas and to assist teachers from rural, suburban, and urban local educational agencies.

(2) The Director shall award grants under this subtitle for a period not to exceed 5 years.

**SEC. 113. AUTHORIZATION OF APPROPRIATIONS.**

There are authorized to be appropriated for the National Science Foundation to carry out this subtitle $15,000,000 for each of fiscal years 2002 through 2006.

# TITLE II—NATIONAL SCIENCE, MATHEMATICS, ENGINEERING, AND TECHNOLOGY EDUCATION DIGITAL LIBRARY

**SEC. 201. IN GENERAL.**

The Director shall establish a program to expand the National Science, Mathematics, Engineering, and Technology Education Digital Library (hereinafter in this Act referred to as the "Digital Library") program to enable timely and continuous dissemination of elementary and secondary science, math, engineering, and technology educational resources, materials, practices, and policies through the Internet and other digital technologies. The expanded Digital Library shall—

(1) contain an Internet-based repository of curricular materials, practices, and teaching modules;

(2) contain, to the extent practicable, an Internet-based repository of information about national and regional conferences related to the improvement of elementary and secondary mathematics, science, engineering and technology education, including, if appropriate, links to materials generated by those conferences.

(3) provide users of the Digital Library with access to all materials in the Digital Library through a single entry point;

(4) contain only materials that have been peer-reviewed and tested to ensure factual accuracy and effectiveness and that are aligned with recognized State and national mathematics and science standards;

(5) present materials in a format that is consistent, facilitates ease of comparison and use by classroom teachers, and contains appropriate links to other Federal educational clearinghouses; and

(6) provide materials related to mathematics and science partnership programs, including—

(A) links to all of the programs developed through the mathematics and science partnerships established under subtitle A of title I;

(B) data related to assessment and evaluation and final program reports developed under subtitle A of title I, including both positive and negative outcomes of the program;

(C) materials developed by the partnerships under subtitle A of title I that have been demonstrated to be effective; and

(D) a mechanism for users to make comments or suggestions regarding the use and effectiveness of posted materials.

**SEC. 202. GRANTS AND CONTRACT.**

(a) GRANTS.—The Director may award grants to institutions of higher education or other qualified entities—

(1) to design all or parts of the Digital Library;

(2) to provide assistance to schools in the selection and adaptation of curricular materials, practices and teaching methods made available through the Digital Library; or

(3) to carry out the activities described in both paragraphs (1) and (2).

Grants awarded under this subsection may cover the costs of acquiring and reviewing educational materials for dissemination through the Digital Library.

(b) OPERATION.—The Director may contract out the operation and management of the Digital Library.

(c) COMPETITIVE AWARDS.—Grants and contracts shall be awarded under this section on a competitive basis.

**SEC. 203. AUTHORIZATION OF APPROPRIATIONS.**

There are authorized to be appropriated for the National Science Foundation to carry out this title $20,000,000 for each of fiscal years 2002 through 2006.

# TITLE III—STRATEGIC EDUCATION RESEARCH PROGRAM

## Subtitle A—Centers

**SEC. 301. ESTABLISHMENT OF CENTERS FOR RESEARCH ON LEARNING AND EDUCATION IMPROVEMENT.**

(a) IN GENERAL.—(1) The Director shall award grants to institutions of higher education (or consortia thereof) to establish 4 multidisciplinary Centers for Research on Learning and Education Improvement.

(2) Grants shall be awarded under this subsection on a merit-reviewed competitive basis.

(b) PURPOSE.—The purpose of the Centers shall be to conduct and evaluate research in cognitive science, education and related fields and to develop ways in which the results of such research can be applied in elementary and secondary classrooms to improve the teaching of mathematics and science.

(c) FOCUS.—(1) Each Center shall be focused on a different challenge faced by elementary or secondary school teachers of mathematics and science. In determining the research focus of the Centers, the Director shall consult with the National Academy of Sciences and take into account the extent to which other Federal programs support research on similar questions.

(2) The proposal solicitation issued by the Director shall state the focus of each Center and applicants shall apply for designation as a specific Center.

**SEC. 302. SELECTION PROCESS.**

(a) APPLICATION.—An institution of higher education (or a consortium thereof) seeking funding under this title shall submit an application to the Director at such time, in such manner, and containing such information as the Director may require. The application shall include, at a minimum a description of—

(1) the initial research projects that will be undertaken by the Center and the process by which new projects will be identified;

(2) how the Center will work with other research institutions and schools to broaden the national research agenda on learning and teaching;

(3) how the Center will promote active collaboration among physical, biological, and social science researchers;

(4) how the Center will promote active participation by elementary and secondary mathematics and science teachers and administrators; and

(5) how the Center will reduce the results of its research to educational practice and assess the success of new practices.

(b) REVIEW OF APPLICATIONS.—In evaluating the applications submitted under subsection (a), the Director shall consider, at a minimum—

(1) the ability of the applicant to effectively carry out the research program and reduce its results to effective educational practice;

(2) the experience of the applicant in conducting research on the science of teaching and learning and the capacity of the applicant to foster new multidisciplinary collaborations;

(3) the capacity of the applicant to attract precollege educators from a diverse array of schools and professional experiences for participation in Center activities; and

(4) the capacity of the applicant to attract and provide adequate support for graduate students to pursue research at the intersection of educational practice and basic research on human cognition and learning.

(c) AWARDS.—The Director shall ensure, to the extent practicable, that the Centers funded under this section conduct research and develop educational practices designed to improve the educational performance of a broad range of students, including those from groups underrepresented in mathematics, science and engineering.

**SEC. 303. ANNUAL CONFERENCE.**

The Director shall convene an annual meeting of the Centers to foster collaboration among the Centers and to further disseminate the results of the Centers' activities.

**SEC. 304. AUTHORIZATION OF APPROPRIATIONS.**

There are authorized to be appropriated for the National Science Foundation to carry out this title $12,000,000 for each of fiscal years 2002 through 2006.

# Subtitle B—Fellowships

**SEC. 311. EDUCATION RESEARCH TEACHER FELLOWSHIPS.**

(a) ESTABLISHMENT.—(1) The Director shall establish a program to award grants to institutions of higher education or eligible nonprofit entities (or consortia thereof) to provide research opportunities related to the science of learning to elementary and secondary school teachers of science and mathematics.

(2) Grants shall be awarded under this section on a merit-reviewed competitive basis.

(b) PROGRAM COMPONENTS.—Grant recipients under this section—

(1) shall recruit and select teachers and provide such teachers with opportunities to conduct research in the fields of—

(A) brain research as a foundation for research on human learning;

(B) behavioral, cognitive, affective, and social aspects of human learning;

(C) science and mathematics learning in formal and informal educational settings; or

(D) learning in complex educational systems;

(2) shall ensure that participating teachers have mentors and other programming support to ensure that their research experience will contribute to their understanding of the science of learning;

(3) shall provide programming, guidance, and support to ensure that participating teachers disseminate information about the current state of education research and its implications on classroom practice to other elementary and secondary educators and can use that information to improve their performance in the classroom;

(4) shall provide participating teachers with a scholarship stipend; and

(5) may provide room and board for residential programs.

(c) USE OF FUNDS.—(1) Not more than 25 percent of the funds provided under a grant under this section may be used for programming support for participating teachers.

(2) The Director shall issue guidelines specifying the minimum or maximum amounts of stipends grant recipients may provide to teachers under this section.

(d) DURATION.—A teacher may participate in research under the program under this section for up to 1 calendar year or 2 sequential summers.

(e) APPLICATION.—An institution of higher education or eligible nonprofit entity (or a consortium thereof) seeking funding under this section shall submit an application to the Director at such time, in such manner, and containing such information as the Director may require. The application shall include, at a minimum—

(1) a description of the research opportunities that will be made available to elementary or secondary school teachers, or both, by the applicant;

(2) a description of how the applicant will recruit teachers to participate in the program, and the criteria that will be used to select the participants;

(3) a description of the number, types, and amounts of the scholarships that the applicant intends to offer to participating teachers; and

(4) a description of the programming support that will be provided to participating teachers to enhance their research experience and to enable them to educate their peers about the value, findings, and implications of education research.

(f) REVIEW OF APPLICANTS.—In evaluating the applications submitted under subsection (e), the Director shall consider, at a minimum—

(1) the ability of the applicant to effectively carry out the proposed program;

(2) the extent to which the applicant is committed to making the program a central organizational focus; and

(3) the likelihood that the research experiences and programming to be offered by the applicant will improve elementary and secondary education.

(g) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the National Science Foundation for carrying out this section $5,000,000 for each of fiscal years 2002 through 2004.

# TITLE IV—ROBERT NOYCE SCHOLARSHIP PROGRAM

**SEC. 401. DEFINITIONS.**

In this title—

(1) the term "mathematics and science teacher" means a mathematics, science, or technology teacher at the elementary or secondary school level;

(2) the term "mathematics, science, or engineering professional" means a person who holds a baccalaureate, masters, or doctoral degree in science, mathematics, or engineering and is working in that field or a related area;

(3) the term "scholarship" means an award under section 405; and

(4) the term "scholarship recipient" means a student receiving a scholarship;

(5) the term "stipend" means an award under section 406;

(6) the term "stipend recipient" means a science, mathematics or engineering professional receiving a stipend; and

(7) the term "cost of attendance" has the meaning given such term in section 472 of the Higher Education Act of 1965 (20 U.S.C. 1087ll).

**SEC. 402. SCHOLARSHIP PROGRAM.**

(a) IN GENERAL.—(1) The Director shall establish a program to award grants to institutions of higher education (or consortia thereof) to provide scholarships and programming designed to recruit and train mathematics and science teachers. Such program shall be known as the "Robert Noyce Scholarship Program".

(2) Grants shall be provided under this section on a merit-reviewed competitive basis.

(b) USE OF GRANTS.—Grants provided under this title shall be used by institutions of higher education—

(1) to develop and implement a program to encourage top college juniors and seniors majoring in mathematics, science, and engineering at the grantee's institution to become mathematics and science teachers, through—

(A) administering scholarships in accordance with section 405;

(B) offering programs to help scholarship recipients to teach in elementary and secondary schools, including programs that will result in teacher certification; and

(C) offering programs to scholarship recipients, both before and after they receive their baccalaureate degree, to enable the recipients to become better mathematics and science teachers, and to exchange ideas with others in their fields; or

(2) to develop and implement a program to encourage science, mathematics, or engineering professionals to become mathematics and science teachers, through—

(A) administering stipends in accordance with section 406;

(B) offering programs to help stipend recipients obtain teacher certification; and

(C) offering programs to stipend recipients, both during and after matriculation, to enable recipients to become better mathematics and science teachers and exchange ideas with others in their fields; or

(3) for both of the purposes described in paragraphs (1) and (2).

**SEC. 403. SELECTION PROCESS.**

(a) APPLICATION.—An institution of higher education (or a consortium thereof) seeking funding under this title shall submit an application to the Director at such time, in such manner, and containing such information as the Director may require. The application shall include, at a minimum—

(1) a description of the scholarship or stipend program, or both, that the applicant intends to operate, including the number of scholarships or the size and number of stipends the applicant intends to award, and the selection process that will be used in awarding the scholarships or stipends;

(2) evidence that the applicant has the capability to administer the scholarship or stipend program in accordance with the provisions of this title; and

(3) a description of the programming that will be offered to scholarship or stipend recipients during and after their matriculation.

(b) REVIEW OF APPLICATIONS.—In evaluating the applications submitted under subsection (a), the Director shall consider, at a minimum—

(1) the ability of the applicant to effectively carry out the program;

(2) the extent to which the applicant is committed to making the program a central organizational focus;

(3) the ability of the proposed programming to enable scholarship or stipend recipients to become successful mathematics and science teachers;

(4) the number and quality of the students that will be served by the program; and

(5) the ability of the applicant to recruit students who would otherwise not pursue a career in teaching.

**SEC. 404. AWARDS.**

(a) DESIGNATION.—The Director shall designate institutions awarded grants under this title as "National Teacher Scholarship Centers".

(b) DISTRIBUTION.—The Director shall ensure, to the extent practicable, that grants be awarded under this title in a wide range of geographic areas and to prepare students for jobs in rural, suburban, and urban local educational agencies.

(c) DURATION.—Grants awarded under this title shall be for a period of 10 years.

**SEC. 405. SCHOLARSHIP REQUIREMENTS.**

(a) IN GENERAL.—Scholarships under this title shall be available only to students who are—

(1) majoring in science, mathematics, or engineering; and

(2) in the last 2 years of a baccalaureate degree program.

(b) SELECTION.—Individuals shall be selected to receive scholarships primarily on the basis of academic merit, with consideration given to financial need and to the goal of promoting the participation of minorities, women, and people with disabilities.

(c) AMOUNT.—Scholarships under this title shall be in the amount of $7,500 per year, or the cost of attendance, whichever is less. Individuals may receive a maximum of 2 years of scholarship support.

(d) SERVICE OBLIGATION.—If an individual receives a scholarship, that individual shall be required to complete, within 6 years after graduation from the baccalaureate degree program for which the scholarship was awarded, 2 years of service as a mathematics or science teacher for each year a scholarship was received. Service required under this subsection shall be performed at a school receiving assistance under chapter 1 of title I of the Elementary and Secondary Education Act of 1965 (Public Law 89–10).

**SEC. 406. STIPENDS.**

(a) IN GENERAL.—Stipends under this title shall be available only to mathematics, science, and engineering professionals who, while receiving the stipend, are enrolled in a program to receive certification to teach.

(b) SELECTION.—Individuals shall be selected to receive stipends under this title primarily on the basis of academic merit, with consideration given to financial need and to the goal of promoting the participation of minorities, women, and people with disabilities.

(c) AMOUNT.—Stipends under this title shall be for an amount of up to $7,500 per year, but in no event more than the cost of attendance. Individuals may receive a maximum of 1 year of stipend support.

(d) SERVICE OBLIGATION.—If an individual receives a stipend under this title, that individual shall be required to complete, within 6 years after graduation from the program for which the stipend was awarded, 2 years of service as a mathematics or science teacher for each year a stipend was received. Service required under this subsection shall be performed at a school receiving assistance under chapter 1 of title I of the Elementary and Secondary Education Act of 1965 (Public Law 89–10).

**SEC. 407. CONDITIONS OF SUPPORT.**

As a condition of acceptance of a scholarship or stipend under this title, a recipient shall enter into an agreement with the institution of higher education—

(1) accepting the terms of the scholarship or stipend pursuant to sections 405 and 409 or section 406;

(2) agreeing to provide the awarding institution of higher education with annual certification of employment and current contact information and to participate in surveys provided by the institution of higher education as part of an ongoing assessment program; and

(3) establishing that any scholarship recipient shall be liable to the United States for any amount that is required to be repaid in accordance with the provisions of section 409.

**SEC. 408. COLLECTION FOR NONCOMPLIANCE.**

(a) MONITORING COMPLIANCE.—An institution of higher education (or consortium thereof) receiving a grant under this title shall, as a condition of participating in the program, enter into an agreement with the Director to monitor the compliance of scholarship and stipend recipients with their respective service requirements.

(b) COLLECTION OF REPAYMENT.—(1) In the event that a scholarship recipient is required to repay the scholarship under section 409, the institution shall be responsible for collecting the repayment amounts.

(2) Except as provided in paragraph (3), any repayment shall be returned to the Treasury of the United States.

(3) A grantee may retain a percentage of any repayment it collects to defray administrative costs associated with the collection. The Director shall establish a single, fixed percentage that will apply to all grantees.

**SEC. 409. FAILURE TO COMPLETE SERVICE OBLIGATION.**

(a) GENERAL RULE.—If an individual who has receive a scholarship under this title—

(1) fails to maintain an acceptable level of academic standing in the educational institution in which the individual is enrolled, as determined by the National Science Foundation;

(2) is dismissed from such educational institution for disciplinary reasons;

(3) withdraws from the baccalaureate degree program for which the award was made before the completion of such program;

(4) declares that the individual does not intend to fulfill his service obligation under this title; or

(5) fails to fulfill the service obligation of the individual under this title,

such individual shall be liable to the United States as provided in subsection (b).

(b) AMOUNT OF REPAYMENT.—(1) If a circumstance described in subsection (a) occurs before the completion of one year of a service obligation under this title, the United States shall be entitled to recover from the individual, within one year after the date of the occurrence of such circumstance, an amount equal to—

(A) the total amount of awards received by such individual under this title; plus

(B) the interest on such amounts which would be payable if at the time the amounts were received they were loans bearing interest at the maximum legal prevailing rate, as determined by the Treasurer of the United States,

multiplied by 2.

(2) If a circumstance described in subsection (a)(4) or (a)(5) occurs after the completion of one year of a service obligation under this title, the United States shall be entitled to recover from the individual, within one year after the date of the occurrence of such circumstance, an amount equal to—

(A) the total amount of awards received by such individual under this title minus $3,750 for each full year of service completed; plus

(B) the interest on such amounts which would be payable if at the time the amounts were received they were loans bearing interest at the maximum legal prevailing rate, as determined by the Treasurer of the United States.

(c) EXCEPTIONS.—(1) The National Science Foundation may provide for the partial or total waiver or suspension of any service obligation or payment by an individual under this title whenever compliance by the individual is impossible or would involve extreme hardship to the individual, or if enforcement of such obligation with respect to the individual would be unconscionable.

(2) Any obligation of an individual under this title for payment under subsection (b) may be released by a discharge in bankruptcy under title 11, United States Code, only if such discharge is granted after the expiration of the 5-year period beginning on the first date that such payment is required.

**SEC. 410. REPORT.**

(a) DATA COLLECTION.—Institutions receiving grants under this title shall supply to the Director any relevant statistical and demographic data on scholarship recipients and stipend recipients the Director may request, including information on employment required by section 407.

(b) ASSESSMENT.—Not later than 7 years after the date of the enactment of this Act, the Director shall submit to Congress a report assessing the impact of the implementation of this title on drawing into teaching top mathematics and science students, including students from groups underrepresented in mathematics, science and engineering.

**SEC. 411. AUTHORIZATION OF APPROPRIATIONS.**

(a) IN GENERAL.—There are authorized to be appropriated to the National Science Foundation to carry out this title $20,000,000 for each of fiscal years 2002 through 2005.

(b) SPECIFIC APPROPRIATIONS.—There are authorized to be appropriated to the National Science Foundation to support the activities described in subsections (b)(1)(A) and (C) and (b)(2)(A) and (C) of section 402, such sums as may be necessary for each of fiscal years 2006 through 2011.

# TITLE V—REQUIREMENTS FOR RESEARCH CENTERS

**SEC. 501. REQUIREMENTS FOR RESEARCH CENTERS.**

The Director shall ensure that any National Science Foundation program that awards grants for the establishment of research centers at institutions of higher education after the date of the enactment of this Act—

(1) requires that every center offer programs for elementary and secondary mathematics and science teachers and students to increase their understanding of the field in which the center specializes; and

(2) uses the quality of a center's proposed precollege education programs as a criterion in determining grant awards.

# TITLE VI—EDUCATIONAL TECHNOLOGIES RESEARCH

**SEC. 601. EDUCATIONAL TECHNOLOGY RESEARCH CENTERS.**

(a) IN GENERAL.—(1) The Director shall establish a program to award grants to institutions of higher education (or consortia thereof) to establish centers to evaluate and improve the effectiveness of information technologies in elementary and secondary mathematics and science education.

(2) Grants shall be awarded under this title on a merit-reviewed competitive basis.

(b) ACTIVITIES.—Centers established under this title shall, at a minimum—

(1) identify educational approaches and techniques that are based on the use of information technology and that have the potential for being effective in classroom settings;

(2) develop methods to measure the effectiveness of various applications of information technology in mathematics and science education, including methods to measure student performance;

(3) evaluate the effectiveness of the use of technology in elementary and secondary mathematics and science education in a variety of classroom settings; and

(4) identify the key variables that influence educational effectiveness and the conditions necessary to implement successfully an approach or technique determined to be educationally effective for a particular educational setting;

(5) ensure that the results of such evaluations are widely disseminated; and

(6) develop a program to work with local educational agencies to help them apply the results of the research conducted under this section.

**SEC. 602. SELECTION PROCESS.**

(a) APPLICATION.—An institution of higher education (or a consortium thereof) seeking funding under this title shall submit an application to the Director at such time, in such manner, and containing such information as the Director may require. The application shall include, at a minimum, a description of—

(1) the approaches to the use of information technology that the center will initially evaluate, how it chose those approaches, how it will seek out any additional approaches, and how assessment procedures would be developed and applied;

(2) how the center will work with local education agencies to evaluate the approaches in classrooms;

(3) how the center will disseminate the results of its work; and

(4) how the center will develop an outreach program to work with local educational agencies to help them apply the results of its research.

(b) REVIEW OF APPLICATIONS.—In evaluating the applications submitted under subsection (a), the Director shall consider, at a minimum, the ability of the applicant to effectively evaluate information technology approaches and to help local education agencies apply the results of those evaluations.

(c) AWARDS.—The Director shall ensure, to the extent practicable, that the program established under this title evaluates information technology—

(1) in a wide range of grade levels and geographic areas;

(2) in rural, suburban, and urban schools; and

(3) with a wide variety of students in terms of race, ethnicity, and income.

**SEC. 603. DOCUMENTATION AND DISSEMINATION OF RESULTS.**

(a) IN GENERAL.—The results of the research and evaluations conducted in accordance with section 601 shall be documented and widely disseminated, including through publication in peer-reviewed scholarly journals.

(b) WORKSHOPS, CONFERENCE, AND WEB SITES.—The Director is authorized to sponsor and support workshops, conferences, and dedicated web sites to disseminate information about the activities of the educational technology research centers established under section 601.

(c) DEPOSIT IN LIBRARY.—Information about effective approaches and techniques, including information and materials necessary for their implementation, shall be deposited in the Digital Library.

**SEC. 604. AUTHORIZATION OF APPROPRIATIONS.**

There are authorized to be appropriated to the National Science Foundation to carry out the program established under section 601—

(1) $25,000,000 for each of fiscal years 2002 through 2004; and

(2) $30,000,000 for each of fiscal years 2005 and 2006.

# TITLE VII—MISCELLANEOUS PROVISIONS

**SEC. 701. MATHEMATICS AND SCIENCE PROFICIENCY PARTNERSHIPS.**

(a) FINDINGS.—Congress finds the following:

(1) Proficiency in mathematics, science, and information technology is necessary to prepare all students in the United States for participation in the 21st Century and to guarantee that the United States economy remains vibrant and competitive.

(2) In order to achieve such results, it is important that the Federal Government shows interest in economically disadvantaged students who have not been provided with opportunities that will improve their knowledge of mathematics, science, and technology.

(3) Many economically disadvantaged students in urban and rural America share a common need to receive a quality education, but often the schools of such students lack the needed resources to lift those students into the information age.

(4) The schools and businesses serving urban and rural communities are strategically positioned to form a unique partnership with students that will increase their mathematics, science, and technology proficiency and encourage and support their undergraduate study in those fields for the benefit of the Nation.

(b) AUTHORITY.—(1)(A) The Director shall establish a demonstration project under which the Director awards grants in accordance with this section to eligible local educational agencies.

(B) A local educational agency that receives a grant under this section may use such grant funds to develop a program that builds or expands mathematics, science, and information technology curricula, to purchase equipment necessary to establish such program, and to provide professional development to enhance teacher quality in those fields.

(2) A program described in paragraph (1) shall—

(A) provide teacher professional development specifically in information technology, mathematics, and science; and

(B) provide students with a rich standards-based course of study in mathematics, science, and information technology.

(c) ELIGIBLE LOCAL EDUCATIONAL AGENCIES.—For purposes of this section, a local educational agency is eligible to receive a grant under this section if the agency—

(1) provides assurances that it has executed conditional agreements with representatives of the private sector to provide services and funds described in subsection (d); and

(2) agrees to enter into an agreement with the Director to comply with the requirements of this section.

(d) PRIVATE SECTOR PARTICIPATION.—The conditional agreements referred to in subsection (c)(1) shall describe participation by the private sector, including—

(1) the donation of computer hardware, software, and other technology tools;

(2) the establishment of internship and mentoring opportunities for students who participate in the mathematics, science, and information technology program; and

(3) the donation of higher education scholarship funds for eligible students to continue their study of mathematics, science, and information technology.

(e) APPLICATION.—(1) To apply for a grant under this section, each eligible local educational agency shall submit an application to the Director in accordance with guidelines established by the Director pursuant to paragraph (2).

(2)(A) The guidelines referred to in paragraph (1) shall require, at a minimum, that the application include—

(i) a description of proposed activities consistent with the uses of funds and program requirements under paragraphs (1)(B) and (2) of subsection (b);

(ii) a description of the higher education scholarship program, including criteria for selection, duration of scholarship, number of scholarships to be awarded each year, and funding levels for scholarships; and

(iii) evidence of private sector participation and financial support to establish an internship, mentoring, and scholarship program.

(B) The Director shall issue and publish such guidelines not later than 6 months after the date of the enactment of this Act.

(3) The Director shall select a local educational agency to receive an award under this section on the basis of merit to be determined after conducting a comprehensive review.

(f) PRIORITY.—The Director shall give special priority in awarding grants under this section to eligible local educational agencies that—

(1) demonstrate the greatest ability to obtain commitments from representatives of the private sector to provide services and funds described under subsection (d); and

(2) demonstrate the greatest economic need.

(g) ASSESSMENT.—The Director shall assess the effectiveness of activities carried out under this section.

(h) STUDY AND REPORT.—The Director—

(1) shall initiate an evaluative study of the effectiveness of the activities carried out under this section in improving student performance in mathematics, science, and information technology at the precollege level and in stimulating student interest in pursuing undergraduate studies in those fields; and

(2) shall report the findings of the study to Congress not later than 4 years after the award of the first scholarship.

Such report shall include the number of students graduating from an institution of higher education with a major in mathematics, science, or information technology and the number of students who find employment in such fields.

(i) DEFINITIONS.—In this section:

(1) The term "conditional agreement" means an arrangement between representatives of the private sector and local educational agencies to provide certain services and funds, such as, but not limited to, the donation of computer hardware and software, the establishment of internship and mentoring opportunities for students who participate in mathematics, science, and information technology programs, and the donation of scholarship funds for use at institutions of higher education by eligible students who have participated in the mathematics, science, and information technology programs.

(2) The term "eligible student" means a student enrolled in the 12th grade who—

(A) has participated in a mathematics, science, and an information technology program established pursuant to this section;

(B) has demonstrated a commitment to pursue a career in information technology, mathematics, science, or engineering; and

(C) has attained high academic standing and maintains a grade point average of not less than 2.7 on a 4.0 scale for the period from the beginning of the 10th grade through the time of application for a scholarship.

(j) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the National Science Foundation to carry out this section $5,000,000 for each of fiscal years 2002 through 2004.

(k) MAXIMUM GRANT AWARD.—An award made to an eligible local educational agency under this section may not exceed $300,000.

**SEC. 702. ARTICULATION PARTNERSHIPS BETWEEN COMMUNITY COLLEGES AND SECONDARY SCHOOLS.**

(a) OUTREACH GRANTS.—In making awards for outreach grants authorized under section 3(c)(2) of the Scientific and Advanced-Technology Act of 1992 (42 U.S.C. 1862i(c)(2)), the Director shall give priority to proposals that involve secondary schools with a majority of students from groups that are underrepresented in the science, mathematics and engineering workforce. Awards in such cases shall not be subject to the requirement under section 3(f)(3) of such Act for a matching contribution.

(b) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the National Science Foundation to carry out this section $5,000,000 for each of fiscal years 2002 through 2004.

**SEC. 703. ASSESSMENT OF IN-SERVICE TEACHER PROFESSIONAL DEVELOPMENT PROGRAMS.**

(a) ASSESSMENT.—The Director shall review all programs sponsored by the National Science Foundation that support in-service teacher professional development for science teachers to determine—

(1) the level of resources and degree of emphasis placed on training teachers in the effective use of information technology in the classroom; and

(2) the allocation of resources between summer activities and follow-on reinforcement training and support to participating teachers during the school year.

(b) REPORT.—The Director shall submit to Congress, not later than 1 year after the date of the enactment of this Act, a report that—

(1) describes the results of the review and assessment conducted under subsection (a);

(2) summarizes the major categories of in-service teacher professional development activities supported at the time of the review, and the funding levels for such activities; and

(3) describes any proposed changes, including new funding allocations, to strengthen the in-service teacher professional development programs of the National Science Foundation that support activities described in paragraphs (a)(1) and (2).

**SEC. 704. INSTRUCTIONAL MATERIALS.**

The Director may award competitive, merit-reviewed grants for the development of educational materials on energy production and use, energy conservation, and renewable energy for use in elementary and secondary schools.

**SEC. 705. STUDY OF BROADBAND NETWORK ACCESS FOR SCHOOLS AND LIBRARIES.**

(a) REPORT TO CONGRESS.—The Director shall conduct a study of the issues described in subsection (c), and not later than 1 year after the date of the enactment of this Act, transmit to Congress a report including recommendations to address those issues. Such report shall be updated annually for 6 additional years.

(b) CONSULTATION.—In preparing the reports under subsection (a), the Director shall consult with the National Aeronautics and Space Administration, the National Institute of Standards and Technology, and such other Federal agencies and educational entities as the Director considers appropriate.

(c) ISSUES TO BE ADDRESSED.—The reports shall—

(1) identify the current status of high-speed, large bandwidth capacity access to all public elementary and secondary schools and libraries in the United States;

(2) identify how the provision of high-speed, large bandwidth capacity access to the Internet to such schools and libraries can be effectively utilized within each school and library;

(3) consider the effect that specific or regional circumstances may have on the ability of such institutions to acquire high-speed, large bandwidth capacity access to achieve universal connectivity as an effective tool in the education process; and

(4) include options and recommendations to address the challenges and issues identified in the reports.

**SEC. 706. EDUCATIONAL TECHNOLOGY ASSISTANCE; LEARNING COMMUNITY CONSORTIUM.**

Section 3 of the Scientific and Advanced Technology Act of 1992 (Public Law 102–476; 42 U.S.C. 1862i) is amended by redesignating subsections (d), (e), (f), and (g) as subsections (f), (g), (h), and (i), respectively, and by inserting after subsection (c) the following new subsections:

"(d) EDUCATIONAL TECHNOLOGY ASSISTANCE.—

"(1) IN GENERAL.—The Director is authorized to make awards on a competitive, merit-reviewed basis to associate-degree granting colleges, bachelor-degree granting institutions, or education service agencies (or consortia thereof) to establish centers to assist elementary and secondary schools in the use of information technology for mathematics, science, or technology instruction.

"(2) ACTIVITIES.—Activities of centers funded under this subsection may include—

"(A) helping schools evaluate their need for information technology;

"(B) training teachers on how to best use information technology in instruction; and

"(C) providing other information and training to help schools and teachers ensure that they have access to appropriate information technologies and are using them to maximum advantage.

"(3) APPLICATION.—An application to receive funds under this subsection shall include, at a minimum—

"(A) a description of the services that will be provided to schools and teachers;

"(B) a list of the schools expected to be served;

"(C) a description of how the applicant will draw on the expertise of its faculty and students to assist schools and teachers; and

"(D) a description of how the applicant will operate the program after funding made available by this subsection has expired.

"(4) SELECTION.—In evaluating applications submitted under paragraph (3), the Director shall consider, at a minimum—

"(A) the ability of the applicant to effectively carry out the program;

"(B) the number of schools and students who would be served and the their need for assistance;

"(C) the extent to which the applicant has worked with participating schools to ensure that priority problems would be addressed by the assistance provided under this subsection; and

"(D) the ability of the applicant to continue to provide assistance after funding under this subsection has expired.

"(5) AWARDS.—(A) The Director shall ensure, to the extent practicable, that the program established by this subsection assists schools in rural, suburban, and urban areas.

"(B) No institution shall receive funds under this subsection for more than three years.

"(6) REPORT.—Not later than April 1, 2005, the Director shall provide a report to Congress assessing the success of the program funded under this subsection and the need of schools for continued assistance, and, based on the experience with the program, recommending ways information technology assistance to schools could be made more broadly available.

"(7) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the National Science Foundation to carry out this subsection $5,000,000 for each of the fiscal years 2002 through 2004.

"(e) LEARNING COMMUNITY CONSORTIUM.—The Director is authorized to provide to a consortium composed of associate-degree granting colleges a grant in the amount of $10,000,000 for the purpose of carrying out a pilot project to encourage women, minorities and persons with disabilities to enter and complete programs in mathematics, science, engineering and technology.".

## II. PURPOSE OF THE BILL

The purpose of the bill is to make improvements in K–12 mathematics and science education, and for other purposes.

## III. BACKGROUND AND NEED FOR THE LEGISLATION

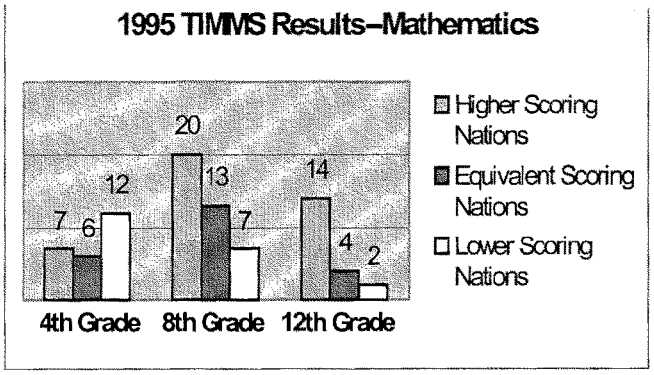
For years the United States has not provided many of its children with a world-class education. In 1983, Secretary of Education Terrence Bell spurred a national dialogue about mathematics and science education by releasing the provocative report "A Nation At risk" which documented the steady decline in the educational achievement of our children. The report stated its findings in dramatic terms:

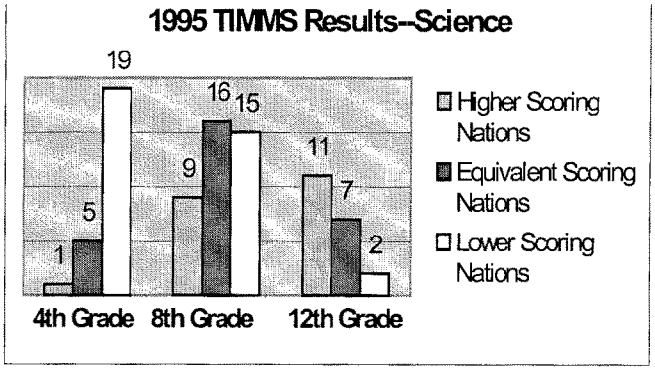
> If an unfriendly power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war. As it stands, we have allowed this to happen to ourselves. We have even squandered the gains in achievement make in the wake of the Sputnik challenge. Moreover, we have dismantled essential support systems which helped make those gains possible. We have, in effect, been committing an act of unthinking, unilateral educational disarmament.

In September of 1989, President George H. Bush responded to this report by convening an Education Summit at which the 49

participating Governors agreed to set national education goals. The Charlottesville Summit was the first time that national and state political leaders from both parties, with diverse views on education reform, reached consensus on what the nation's highest education priorities should be. One year later President Bush formally proposed, and the Governors adopted, eight national goals. Among these was the goal that by the year 2000, the United States would be first in the world in mathematics and science.

Unfortunately, recent evidence demonstrates quite clearly that the United States is not meeting the education goals it set for itself more than ten years ago. In 1995, the Third International Mathematics and Science Study (TIMSS) evaluated the math and science performance of students in fourth, eighth, and twelfth grades in 42 different countries. While U.S. fourth graders performed above the international average in both science and mathematics, eighth grade students performed at the international average in science and below the international average in mathematics. U.S. students in the twelfth grade, including our most advanced students, ranked among the lowest of all countries participating in the study.






In 1999, a repeat of the TIMSS study (TIMSS–R) demonstrated that despite the high scores made four years earlier by fourth-grade students, the mathematics and science achievement of U.S. eight-grade students was still only at about the international average. This follow-up study confirmed that the decline in relative performance of students during the middle school years continues to be a serious problem. Clearly, we can no longer assume that our best and brightest students will be able to provide the extraordinary intellectual leadership that has allowed the United States to overcome the obstacles created by an education system that fails many of its students.

The inability of our Nation's schools to provide children with a world-class education in mathematics and science as illustrated by the TIMSS–R has strategic and economic consequences. On February 15, 2001, the U.S. Commission on National Security/21st Century, released its report "Road Map for National Security: Imperative for Change."

This Federal Commission was chartered by the Secretary of Defense and the Congress to deliver a security strategy and implementation plan designed to meet the emerging challenges of the 21st century. Echoing "A Nation At Risk," the report concluded that:

> The scale and nature of the ongoing revolution in science and technology, and what this implies for the quality of human capital in the 21st century, pose critical national security challenges for the United States. Second only to a weapon of mass destruction detonating in an American city, we can think of nothing more dangerous than a failure to manage properly science, technology, and education for the common good over the next quarter century.

Clearly, significant and immediate efforts must be made to better prepare today's math and science students who will be tomorrow's technology workers, researchers, educators, policy makers, leaders and citizens. These efforts must involve all segments of our society.

President George W. Bush has called on the Nation to develop partnerships involving parents, teachers, school administrators, chief state school officers, leaders of the business community, and institutions of higher education. Individually, none of these groups has the capacity to address the problem that is before us. By forming partnerships, however, each group can make meaningful contributions and can accomplish together what none of them can accomplish alone.

The National Mathematics and Science Partnerships Act responds to the President's call. Using the resources of the National Science Foundation, it encourages local communities to participate in model partnerships designed to reform the instruction of elementary and secondary school mathematics and science education. The Partnerships Act recognizes the unique contribution that institutions of higher education and businesses can make to education reform. It draws upon these strengths to develop model programs that, if proven successful, will hold the key to large-scale education reform efforts that can be conducted by state and local educational agencies.

One of the first challenges that the partnerships must face will be the development and implementation of better preparatory training and professional programs for teachers. Under the partnership model, successful efforts will look beyond the colleges of education to involve professional scientists, mathematicians and engineers from institutions of higher education, government and industry. New models for professional development will be developed and elementary and secondary mathematics and science teachers will be given opportunities to expand their own horizons through research opportunities at universities, government or industry laboratories.

The need to recruit well-prepared teachers is an equally critical challenge to mathematics and science education reform. A recent study conducted by the National Council for Accreditation of Teacher Preparation showed that 50,000 new teachers enter the profession each year lacking appropriate preparation. Nearly 25% of all secondary teachers do not have a college major or minor in their main teaching field and, in particular, more than 30% of secondary mathematics teachers hold neither a major nor a minor in mathematics. Teachers must possess a command of science and math content at a level sufficient to distill the important concepts and methodology and to present activities and opportunities to students that will allow them to explore and understand basic concepts, logic, and applications of mathematics and science. To encourage mathematics, science, and engineering students to pursue careers in teaching, the Act establishes the Noyce Scholarship Program in which students are offered scholarships in exchange for a commitment to teach. In addition, the Noyce Scholarship Program will facilitate transitions to careers in teaching for the most capable science, engineering, mathematics and technology professionals. These scholarships are named for Robert N. Noyce, an inventor of the integrated circuit and co-founder of Intel.

Teacher recruitment, preparation and professional development and other education reform efforts must be guided by a more robust body of research about student learning. Recent reports of the National Academy of Sciences have shown that a wide and trouble-

some gap exists between our current understanding of how the brain functions during learning and actual classroom practices. The gap between research and practice is even wider in the use of educational technologies in instruction or assessment. Aggressive technological expansion programs have resulted in the acquisition of computer technology by over 99% of schools, yet many schools have not optimized the use of these computers for instruction, assessment, or teacher enhancement. In part, this disparity in the use of technology is the result of a shortage of professional development opportunities for teachers, but also reflects a fundamental lack of understanding of how best to use technology in teaching. The Partnerships Act recognizes that better research must provide the foundation for state and local education reform efforts. Titles III and VI of the Partnerships Act authorize research programs designed to provide educators and policy makers with scientifically based methods and materials upon which to build education reform activities.

In short, this Act calls on individuals, institutions of higher education, state and local educational agencies and corporations to collaboratively develop and implement programs to recruit the Nation's brightest into careers in teaching, support these teachers through meaningful training, engage them in high quality lifelong learning opportunities, and arm them with scientifically-based, empirically validated teaching tools and practices to enable them to be successful in their work.

## IV. Summary of Hearings

On Wednesday, March 7, 2001, the House Committee on Science held a hearing to gather teachers' perspectives on how the federal government can help improve K–12th grade science and math education. Testifying before the committee were four teachers representing elementary, middle, and secondary math and science educators, three of whom were recipients of the prestigious Presidential Award for Excellence in Science and Mathematics Teaching. These witnesses spoke to the importance of improving the quality and availability of professional development, developing better student assessment tools, increasing the prestige of mathematics and science teachers, reducing the professional isolation experienced in the classroom, and building stronger partnerships between schools and universities.

On Wednesday, May 2, 2001, the House Science Committee's Subcommittee on Research held a hearing on ways the National Science Foundation could most effectively stimulate K–12 math and science education reform. The witnesses addressed the central role that higher education, business, and school district partnerships can play in stimulating science and mathematics education reform. The witnesses emphasized the importance of high quality professional development programs, the important role that the prestige of business partners can play in encouraging broader acceptance of reform activities, the need to recruit better prepared teachers, the important mentoring role that can be played by master teachers, and the importance of long-term rather than short-term programs.

On May 10, 2001, the House Science Committee's Subcommittee on Research held a hearing to examine the gap that currently exists between what is known about how people learn and the meth-

ods and materials educators use to teach. The witnesses gave testimony to the critical importance of establishing a long-term research agenda designed to bridge the gap between cognitive science and education research and to finding better ways to ensure that the results of this research are incorporated into teacher education, professional development, and classroom activities.

## V. Committee Action

On May 16, 2001, Science Committee Chairman Sherwood Boehlert introduced H.R. 1858, the National Mathematics and Science Partnerships Act, a bill to authorize appropriations for science, mathematics, engineering and technology education for Fiscal Years 2003 through 2011.

The Subcommittee on Research met on June 7, 2001, to consider the bill. An en bloc amendment was offered by Subcommittee Chairman Nick Smith and the ranking member of the Subcommittee, Eddie Bernice Johnson. In addition to making technical corrections to the bill, the amendment (1) removed the requirement for matching funds for each authorized program and instead permitted the Director of the National Science Foundation (NSF) to establish matching requirements for any of the programs authorized by the bill with the exception of the Noyce Scholarship program; (2) specified that allowable activities under the Mathematics and Science Education Partnerships include programs that encourage the interest of girls in science, mathematics, engineering, and technology; (3) required applications for Partnership grants that will provide education programs for students to describe how the proposed activities will encourage the interest of women and minorities in science, mathematics, engineering, and technology and prepared them to pursue further education in those fields; (4) enabled funds from Digital Libraries grants to be used to provide assistance to schools using materials made available through the Digital Library; (5) required the NSF Director to consider the capacity of grant applicants for the Strategic Education Research Centers to attract and support graduate students studying education research and related fields; (6) established a fellowship program for K–12 teachers to pursue education research at institutions of higher education; (7) changed the amount that Noyce scholarship recipients must pay back if they fail to complete their full service obligation; (8) removed the requirement that NSF hold a conference on improving K–12 science, mathematics, engineering, and technology education; (9) established a program at NSF to award grants to local educational agencies working in partnership with industry to develop and improve K–12 math, science, and information technology education programs; (10) required the NSF Director to give priority to grant proposals under the Scientific and Advanced-Technology Act of 1992 to proposals that involve secondary schools with a majority of students from groups underrepresented in the science, mathematics, and engineering workforce; (11) required the NSF Director to review NSF's in-service teacher professional development programs; and (12) established a program to award grants for the creation of centers to evaluate and improve the effectiveness of K–12 information technologies. The amendment was adopted by voice vote. With a quorum present, Ms. Johnson moved that the Subcommittee favorably report the bill, H.R. 1858, as amended, to the

Full Committee on Science with the recommendation that it be in order for the amendment, in the nature of a substitute adopted by the Subcommittee, to be considered as an original bill for the purpose of amendment under the five minute rule at Full Committee, and that the staff be instructed to make technical and conforming changes to the bill as amended. The motion was agreed to by a voice vote.

On June 13, 2001, the Full Committee met to consider the bill, H.R. 1858, as reported by the Subcommittee on Research. An en bloc amendment was offered by Committee Chairman Sherwood Boehlert and ranking member Ralph Hall. In addition to making technical corrections to the bill, the amendment (1) specified that allowable activities under the Mathematics and Science Education Partnerships includes programs that support research projects performed by high school students; (2) allowed funds for Mathematics and Science Education Partnerships to be used to provide stipends for teachers or students participating in certain training or research activities; (3) required the Digital Library to compile information on national and regional K–12 education conferences; (4) required the Strategic Education Research Centers to conduct research and development activities designed to improve the performance of a broad range of students; (5) required Noyce Scholarship program recipients to supply relevant statistical and demographic data on scholarship and stipend recipients; (6) required the NSF Director to submit a report to Congress on the impact of the program; (7) allowed the NSF Director to award grants for the development of K–12 educational materials on energy issues; (8) required the NSF Director to conduct a study on the impact of and access to high bandwidth capacity to the Internet for schools and libraries; (9) allowed the NSF Director to award grants to higher education institutions to establish centers to assist K–12 schools in the use of information technology for math, science and technology instruction; and (10) allowed the NSF Director to award a grant to a consortium of community colleges to encourage women, minorities, and persons with disabilities to study mathematics, science, engineering, and technology. The amendment was adopted by voice vote. With a quorum present, Mr. Gordon moved that the Committee favorably report the bill, H.R. 1858, as amended, to the House with the recommendation that the bill as amended do pass, and that the staff be instructed to make technical and conforming changes to the bill as amended and prepare the legislative report, and that the Chairman take all necessary steps to bring the bill before the House for consideration. The motion was agreed to by a voice vote.

## VI. Summary of Major Provisions of the Bill

• Authorizes NSF to establish a program of mathematics and science education partnerships involving universities and local educational agencies. These partnerships will focus on a wide array of reform efforts ranging from professional development to curriculum reform. The partnerships may include the state educational agency and 50% of the awards must go to partnerships that include businesses. The program is authorized at $200 million per year for Fiscal Years 2002 through 2006.

• Authorizes a partnership program through which universities will provide scholarships to math and science teachers allowing them to participate in research projects at university, business, state or federal laboratories. The program is authorized at $15 million per year for Fiscal Years 2002 through 2006.

• Authorizes the expansion of the National Science, Mathematics, Engineering, and Technology Education Digital Library to include peer reviewed elementary and secondary mathematics, science, engineering, and technology education materials. The program is authorized at $20 million per year for Fiscal Years 2002 through 2006.

• Authorizes the establishment of four national university-based centers for research on learning and education improvement. The multidisciplinary research centers will conduct and evaluate research in cognitive science and related fields, and will translate the results of that research to educational practice. The program is authorized at $12 million per year for Fiscal Years 2002 through 2006.

• Authorizes a program to provide fellowships to enable K–12 teachers to participate in cognitive science, behavioral, and learning research at universities so that they will better understand the connections between the science of learning and the practice of teaching. The program is authorized at $5 million per year for Fiscal Years 2002 through 2004.

• Authorizes a new scholarship program designed to encourage mathematics, science, and engineering majors to pursue careers in teaching. The program provides grants to universities who will, in turn, award scholarships to mathematics, science and engineering majors who intend to teach. The institutions must also provide education and support programs for the scholarship recipients prior to graduation and during their early years of teaching. Scholarship recipients are required to teach in a K–12 school as payback for the award. Stipends may also be offered to math, science, or engineering professionals who need course work to transition to a career in teaching. The program is authorized at $20 million per year for Fiscal Years 2002 through 2006.

• Requires that any new National Science Foundation-supported research centers at institutions of higher education must work to improve elementary and secondary mathematics and science education.

• Authorizes a program to award grants to universities to establish centers to evaluate and improve the effectiveness of information technologies in elementary and secondary mathematics and science education. The program is authorized at $25 million per year for Fiscal Years 2002 through 2004 and at $30 million per year for Fiscal Years 2005 and 2006.

• Authorizes grants to encourage partnerships between school districts and businesses for enhanced mathematics and science education, including information technology education. Participating businesses must agree to provide mentoring and scholarship opportunities for students. This program is authorized at $5 million per year for Fiscal Years 2002 through 2004.

• Provides additional support for articulation partnerships between community colleges and secondary schools ($5 million per year from 2002–2004), requires the NSF to conduct an assessment

of in-service teacher professional development programs and to study broadband access for schools and libraries, and authorizes a community college pilot project to encourage women, minorities and persons with disabilities to enter and complete programs in mathematics, science, engineering and technology ($10 million).

• Authorizes educational technology assistance centers to assist K–12 schools in the use of information technology for math, science and technology instruction. The program is authorized at $5 million per year for Fiscal Years 2002 through 2004.

## VII. Section-by-Section Analysis (By Title and Section)

*Section 1. Short title*

Cites the Act as the "National Mathematics and Science Partnerships Act."

*Section 2. Findings*

The Committee finds that: (1) 12 years ago the President called upon the Nation's Governors to establish common goals for the improvement of K–12 education; (2) one of the goals was that by the year 2000, U.S. students would be first in the world in math and science achievement; (3) despite the goals, U.S. 8th graders have only demonstrated average performance in math and science achievement; and (4) the U.S. must redouble its efforts in math, science, engineering, and technology education.

*Section 3. Definitions*

Defines: (1) "Director" as the Director of the National Science Foundation; (2) "institution of higher education" as defined in the Higher Education Act of 1965; (3) "eligible nonprofit organization" as nonprofit research institute or nonprofit professional association with a demonstrated experience delivering science and math education as determined by the Director; (4) "local educational agency," "state educational agency," "elementary school," and "secondary school" as defined in the Elementary and Secondary Education Act of 1965.

*Section 4. Authorizations of appropriations*

States that any authorization of appropriations in the bill is in addition to amounts otherwise authorized or appropriated for the National Science Foundation (NSF).

*Section 5. Matching requirements*

Allows the Director of NSF to establish matching fund requirements for any of the programs authorized by the bill, with the exception of the Noyce Scholarship program authorized in Title IV.

### Title I. Mathematics and Science Education Partnerships

#### SUBTITLE A. MATHEMATICS AND SCIENCE EDUCATION PARTNERSHIPS

*Section 101. Program authorized*

Establishes a competitive, merit-based program to award grants to institutions of higher education or eligible nonprofit organizations to establish math and science partnership programs. Requires institutions of higher education to partner with one or more local

educational agencies to be eligible to receive a partnership grant. Includes the option for participation of a State educational agency and/or one or more businesses. Requires that the higher education institution include a mathematics, science or engineering department in the programs carried out through the partnership. Possible activities for partnership programs include teacher recruitment, training, and professional development—including training in educational techniques—distance learning programs, development of curricular materials and assessment tools, and others, including any other activities the NSF Director determines will accomplish the goals of the program. Activities directed toward students should encourage the ongoing interest of girls in science, mathematics, engineering and technology and prepare girls for continued study and careers in these areas. Activities may also include research projects performed by students at secondary schools.

*Section 102. Selection process*

Establishes minimum requirements for grant applications and describes criteria the Director must consider in reviewing them. Requires institutions of higher education to enumerate the Partnership activities to be supported by grant funds and also to describe the role of each partner in the activities of the project. Directs the applicant to describe the activities of the project and their alignment with State and local education standards, the project's basis in relevant education research, how it will serve as a catalyst for reform, and how the project's impact on improved student learning will be assessed. Requires that not fewer than fifty percent of the awards include business. Requires that the Director strive for geographic diversity in making the awards and that they be for no longer than five years.

*Section 103. Accountability and dissemination*

Requires the Director to evaluate the impact of partnerships using a common set of benchmarks and assessment tools to identify best practices and materials developed by Partnership awardees. Requires results of this evaluation effort to be made public through the Digital Library and other media. Establishes that an annual meeting for partnerships awardees be held by the Director to enhance national collaboration.

*Section 104. Authorization of appropriations*

Authorizes $200 million for each of fiscal years 2002 through 2006.

SUBTITLE B. TEACHER RESEARCH SCHOLARSHIP PROGRAM

*Section 111. Program authorized*

Establishes a competitive, merit-based grant program to enable institutions of higher education or eligible nonprofit organizations to provide research opportunities in mathematics, science, and engineering for math and science teachers. Businesses or government laboratories may be included as partners in the program. Grant recipients recruit and select teachers, provide opportunities to conduct research, and provide them with mentors and programming support. Grant recipients must provide a stipend to participating

teachers and may provide room and board. Teachers may engage in research opportunities during the school year or during up to two sequential summers.

*Section 112. Selection process*

Establishes minimum requirements for grant applications and describes criteria the Director must consider in reviewing them. Requires institutions of higher education to describe the proposed research, mentoring, and support programs that will be made available to teacher research fellows and the number, types and amounts of scholarships that will be offered to participating teachers. Limits awards to five years in duration.

*Section 113. Authorization of appropriations*

Authorizes $15 million for each of fiscal years 2002 through 2006.

## Title II. National Science, Mathematics, Engineering, and Technology Education Digital Library

*Section 201. In general*

Directs the NSF director to expand the National Science, Mathematics, Engineering, and Technology Education Digital Library to provide timely and continuous dissemination of K–12 science, mathematics, engineering, and technology educational resources, materials, practices, and policies through the Internet and other digital technologies. Requires dissemination of effective materials developed by the math and science partnerships established under subtitle A of title I including relevant evaluations and assessments and user comments pertaining to those materials.

*Section 202. Grants and contracts*

Allows NSF to provide grants to institutions of higher education and other qualified entities to design all or parts of the digital library and/or provide assistance to schools for the selection and adaptation of curricular materials, practices, and teaching methods that are made available through the Digital Library. Allows the Director to contract out operation of the Digital Library.

*Section 203. Authorization of appropriations*

Authorizes $20 million for each of fiscal years 2002 through 2006.

## Title III. Strategic Education Research Program

### SUBTITLE A. CENTERS

*Section 301. Establishment of centers for research on learning and education improvement*

Directs the NSF Director to establish four multidisciplinary Centers for Research on Learning and Education Improvement by awarding grants, using a merit-based, competitive process, to institutions of higher education. Centers are to conduct and evaluate research in cognitive science, education and related fields and to develop ways in which the results of such research can be applied to the teaching of K–12 math and science. Each Center is to have a

distinct research focus, determined by the Director in consultation with the National Academy of Sciences.

*Section 302. Selection process*

Establishes minimum requirements for grant applications and describes criteria the Director must consider in reviewing them. Requires institutions of higher education to describe how the Center will promote active collaboration between scientific disciplines and with other research institutions, the plan by which existing research will be evaluated, and the way new areas of research will be initiated to fill research gaps. Also requires that proposals describe a plan to promote active partnerships with elementary and secondary schools and to reduce research results to educational practice.

*Section 303. Annual conference*

Requires NSF to convene an annual conference of the Centers to foster collaboration and dissemination of results.

*Section 304. Authorization of appropriations*

Authorizes $12 million for each of fiscal years 2002 through 2006.

SUBTITLE B—FELLOWSHIPS

*Section 311. Education research teacher fellowships*

Establishes a fellowship program for K–12 science and mathematics teachers to pursue education research fellowships at institutions of higher education. Grants are to be awarded on a competitive, peer-reviewed basis to institutions of higher education to set up programs that will enable K–12 teachers to conduct research—on cognitive science; brain research as the basis of human learning; or science and mathematics learning in formal, informal or complex educational settings—under the guidance of a researcher at the institution. Grant recipients must recruit and select teachers, give them opportunities to conduct research, and provide them with mentors and programming support for up to one calendar year or across two sequential summers for each teacher. Grant recipients must provide a stipend to participating teachers and may provide room and board. Authorizes $5 million for each of fiscal years 2002 through 2004.

## Title IV. Robert Noyce Scholarship Program

*Section 401. Definitions*

Defines: (1) "mathematics and science teacher" as a mathematics, science, or technology teacher at the elementary or secondary school level; (2) "mathematics, science, or engineering professional" as a person who holds at least a baccalaureate degree in science, mathematics or engineering and is working in that field or a related area; (3) "scholarship" as an award under section 405; (4) "scholarship recipient" as a student receiving a scholarship; (5) "stipend" as an award under section 406; (6) "stipend recipient" as a science, mathematics or engineering professional receiving a stipend; and (7) "cost of attendance" as defined in section 472 of the Higher Education Act of 1965.

*Section 402. Scholarship program*

Establishes a competitive, merit-based grant program to enable institutions of higher education to obtain grants to award scholarships for the purpose of recruiting and training K–12 science and math teachers. Requires grant recipients to establish programs to encourage top college science, math, and engineering juniors and seniors, and/or science, math, and engineering professionals, to become K–12 science and math teachers by administering scholarships and stipends, offering programs to facilitate the acquisition of teaching skills and teacher certification credentials, and developing post-graduate support programs for teachers following graduation and placement in the field.

*Section 403. Selection process*

Establishes minimum requirements for grant applications and describes criteria the Director must consider in reviewing them. Directs institutions of higher education to describe the scholarship or stipend program including the number of scholarships or number and size of stipends to be awarded, the selection process by which individuals will be selected to receive such awards, and the programming that will be offered to scholarship or stipend recipients during and after matriculation.

*Section 404. Awards*

Designates institutions awarded grants under this title as "National Teacher Scholarships Centers" and requires the Director, to the extent practicable, to insure geographic diversity within the funding portfolio. Establishes a 10-year duration for awards made under this title.

*Section 405. Scholarship requirements*

Requires scholarship recipients to be students who are majoring in science, mathematics or engineering and who are in the last two years of a baccalaureate degree program, and requires selection of recipients to be based primarily on academic merit with consideration given to financial need and the goals of promoting participation of minorities, women, and people with disabilities. Sets the scholarship amount at $7,500 per year, or the cost of attendance, which is less, for a maximum of two years of support. Requires scholarship recipients to complete two years of service as a mathematics or science teacher for each year a scholarship was received.

*Section 406. Stipends*

Requires stipend recipients to be mathematics, science, and engineering professionals who are enrolled in a teacher certification program while receiving the stipend. Requires that scholarships be awarded on the basis of academic merit with consideration given to financial need and the goal of promoting the participation of women, minorities, and people with disabilities. Allows stipends of up to $7,500, or the cost of attendance, whichever is less, for a maximum of one year. Requires stipend recipients to complete two years of service as a mathematics or science teacher in return for the year of stipend support.

*Section 407. Conditions of support*

Requires a scholarship or stipend recipient to accept the service obligation and repayment terms set forth by sections 405 and 409, or section 406; to agree to provide the awarding institution of higher education with annual certification of employment and current contact information; and to agree to participate in surveys as part of the project assessment program.

*Section 408. Collection for noncompliance*

Requires grant recipient institutions to monitor the compliance of scholarship and stipend recipients for their respective service requirements and to collect repayment in the event that the service obligation is not met. Allows the grantee to retain a percentage of any repayment it collects to defray the administrative cost of collection.

*Section 409. Failure to complete service obligation*

Details the repayment requirement for scholarship recipients who fall below acceptable academic achievement standards, are dismissed from educational institutions for disciplinary reasons, withdraw from the degree program, declare an unwillingness to fulfill the service obligation, or fail to complete the service obligation. Requires scholarship recipients who do not complete even a single year of their service obligation to pay back the amount of the award (plus interest) multiplied by two. Requires scholarship recipients who complete at least one year of their service obligation but do not complete the rest to repay the total amount of their award, less $3,750 for each year of service completed, plus interest. Allows suspension of the repayment obligation in cases of undue hardship.

*Section 410. Report*

Requires institutions receiving awards through this title to provide the Director with relevant statistical and demographic data on scholarship and stipend recipients including information on employment required by section 407. Requires the Director to report to Congress, no later than seven years after the date of enactment of this Act, on the extent to which the program succeeded in drawing top mathematics and science students, including those from underrepresented groups, into math and science teaching careers.

*Section 411. Authorization of appropriations*

Authorizes $20,000,000 for each of fiscal years 2002 through 2005 and the necessary sums to fund the program support, reporting, compliance and collections requirements of awardees for each of fiscal years 2006 through 2011.

## Title V. Requirements for Research Centers

*Section 501. Requirements for research centers*

Requires the Director of NSF to ensure that grants to establish new research centers at institutions of higher education incorporate an elementary and secondary mathematics, science, engineering or technology education component into their research and outreach program.

## Title VI. Educational Technologies Research

*Section 601. Educational technology research centers*

Establishes an NSF program to award grants, through a competitive, merit-based process, to institutions of higher education to establish centers to evaluate and improve the effectiveness of information technologies in K–12 math and science education. Centers will identify and study the effectiveness of educational approaches and techniques that utilize information technology, identify the key variables affecting educational effectiveness, and ensure that the results of this analysis are widely disseminated to K–12 schools.

*Section 602. Selection process*

Establishes minimum requirements for grant applications and describes criteria the Director must consider when reviewing them. Directs the Director to award grants to institutions of higher education based on the ability of the applicant to effectively evaluate educational uses of information technology and to help local educational agencies apply the results of those evaluations.

*Section 603. Documentation and dissemination of results*

Requires dissemination of results of projects supported by this title through print media and the digital library and allows the Director to sponsor conferences, workshops, and websites in order to disseminate information further.

*Section 604. Authorization of appropriations*

Authorizes $25 million for each of fiscal years 2002 through 2004 and $30 million for each of fiscal years 2005 and 2006.

## Title VII. Miscellaneous provisions

*Section 701. Mathematics and science proficiency partnerships*

Establishes an NSF program to award grants of up to $300,000 (through a competitive merit-based process) to local educational agencies to develop mathematics, science, and information technology curricula, purchase equipment necessary to establish such programs, and provide professional development opportunities for teachers in support of improved math, science and technology education. In order to qualify for such a grant, the local educational agency must execute an agreement with a private sector entity to provide services and funds that include donations of computers, establishment of internship and mentoring programs, and the provision of college scholarships for students committed to pursuing a career in math, science or information technology. Special priority is to be given to grant applicants that demonstrate the greatest economic need and the greatest ability to attract funds and services from the private sector. Authorizes $5 million for each of fiscal years 2002 through 2004.

*Section 702. Articulation partnerships between community colleges and secondary schools*

For grant awards authorized under section 3(c)(2) of the Scientific and Advanced-Technology Act of 1992, requires the Director to give priority to grant proposals that involve secondary schools

with a majority of students from groups that are underrepresented in the science, mathematics, and engineering workforce. Authorizes $5 million for each of fiscal years 2002 through 2004.

*Section 703. Assessment of in-service teacher professional development programs*

Requires the Director to review all NSF programs that support teacher training programs to determine (1) what level of resources and degree of emphasis is placed on the training of teachers in the effective use of information technologies and (2) the allocation of resources between summer activities and follow-on training and support to participating teachers during the school year. Requires that a report be made to Congress on the results of the review.

*Section 704. Instructional materials*

Allows the NSF Director to award competitive, merit-reviewed grants for the development of educational materials on energy issues for use in elementary and secondary schools.

*Section 705. Study of broadband network access for schools and libraries*

Requires the NSF Director to conduct a study, in consultation with the National Aeronautics and Space Administration, the National Institute of Standards and Technology, and other appropriate entities, on issues related to the current status of high-speed, large bandwidth capacity access to public elementary and secondary schools and libraries.

*Section 706. Educational technology assistance; learning community consortium*

Authorizes the NSF Director to make awards on a competitive, merit-reviewed basis to associate-degree granting colleges, bachelor-degree granting institutions, or education service agencies (or consortia thereof) to establish centers to assist K–12 schools in the use of information technology for mathematics, science, or technology education. Authorizes $5 million for each of fiscal years 2002 through 2004. Also authorizes the NSF Director to provide a grant to a consortium of community colleges for the purpose of carrying out a pilot project to encourage women, minorities and persons with disabilities to enter and complete programs in mathematics, science, engineering and technology. Authorizes $10 million for this program.

## VIII. Committee Views

### MATHEMATICS AND SCIENCE EDUCATION PARTNERSHIPS

The Committee believes that efforts to improve K–12 math and science education have not drawn sufficiently on the expertise and resources of either universities and colleges, or business and industry. The Partnerships program is designed to change that.

If the partnerships are to succeed, they must be truly collaborative. Institutions of higher education and local educational agencies must work together (with any other participating partners) to determine what assistance schools most need, and what assistance universities and colleges are best equipped to provide. In evalu-

ating proposals, NSF must ensure that the partnerships are truly meeting the needs of our nation's schools. Proposals in which a university dictates the terms of the program, or in which a school district seeks a superficial link with a university should be rejected.

NSF is well positioned to run this program. For years, it has been a leader in involving higher education and businesses in innovative education and research projects.

The Committee believes that the Partnership program in this Act is complementary to, and not duplicative of a similarly titled math and science partnership program in H.R. 1, "The No Child Left Behind Act of 2001." While NSF has demonstrated strength in funding innovative demonstration programs to develop and test new models of educational reform, the Department of Education has an infrastructure well suited to the broad implementation and dissemination of new teaching materials, curricula and training programs. The Committee anticipates that the two programs will draw on each other's strengths and that the most promising NSF-funded projects will be used as models and brought to full scale by the Department of Education's partnership program. The Committee expects that the Director of NSF and the Secretary of Education and their staffs will consult regularly to ensure the effective and efficient implementation of both programs.

NSF's strength in education reform is largely due to its policy of awarding grants on the basis of a competitive merit review. The Partnership program explicitly requires that that standard of review be continued.

The Partnership program also explicitly requires that math, science and engineering departments in institutions of higher education be active participants in the partnerships. One of the strengths that universities and colleges bring to the partnerships is the deep expertise of their faculty in the subjects that are taught in elementary and secondary schools. The faculty members also have first-hand knowledge of what kinds of preparation are needed for students to succeed in post-secondary math, science and engineering programs.

While this Act requires that mathematics, science and engineering departments participate in the partnerships, the Committee wants to encourage departments and colleges of education to play an active role as well. The partnerships should be structured to address both subject content and pedagogy, and departments and colleges of education can contribute to assuring that both aspects of teaching are addressed.

The Act also allows "eligible non-profit organizations" to participate in the partnerships, and leaves the determination of eligibility to the Director. The Committee is aware of important contributions to math and science education improvement being made by organizations like the Carnegie Institute and the American Chemical Society. The Committee is also aware of the important role that community-based organizations and other non-profit public interest groups can make to improving education and involving a wide variety of students. NSF should allow, and encourage the partnerships to include non-profit research institutes, professional associations, community-based organizations and other entities that have demonstrated experience, providing math and science education.

The Act also allows consortia of institutions of higher education to submit partnership proposals. The Committee encourages institutions to form consortia to build on their respective strengths. State systems of higher education can apply to the program as consortia.

The Committee expects the partnership program to involve Historically Black Colleges and Universities (HBCUs). HBCUs have a proven record of training African American teachers and often have strong relationships with schools in surrounding communities, especially with schools located in some of the nation's most economically disadvantaged and isolated areas. HBCUs, either individually or as part of consortia, can help meet the requirement that the partnership program strive to address the needs of all types of school districts in all parts of the country.

A key element of ongoing education reform efforts has been the establishment by each of the states of challenging math and science standards and accountability measures. The Committee expects the partnerships funded under this Act to coordinate with state education agencies in the development and implementation of proposals to ensure that the programs and materials are aligned with state and local standards.

The Act includes an extensive list of potential activities that may be undertaken by the partnerships. The Committee emphasizes, however, that this list is not exhaustive and that no partnership is required to undertake any particular activity listed in the Act. The partnership program should support a broad, innovative (and effective) collection of activities, and NSF, through its merit review procedures, has wide latitude to determine which proposed activities would fulfill the purposes of this Act.

The Committee does believe, however, that providing professional development opportunities that enable teachers to use educational technologies effectively should be an important focus of the partnership program. In providing such opportunities, the Act authorizes partnerships to make the technical expertise of graduate and undergraduate students available to elementary and secondary school teachers. Computer literate post-secondary students could provide valuable assistance to teachers in using technology and maintaining an operational technology infrastructure. The Committee also believes that professional development opportunities offered through the partnerships should incorporate the results of research funded under Titles III and VI of this Act (as reported).

The Act allows partnership grants to be used for stipends for teachers or students participating in activities that would not be part of their typical classroom activities. Activities eligible for stipends could include summer or after-school research opportunities for teachers or secondary school students, and summer training programs for teachers. Graduate or undergraduate students providing assistance to schools through activities permitted by section 101(c)(3) might also receive stipends.

In evaluating applications, NSF is to consider the extent to which the members of the partnerships are committed to making the partnership a central organizational focus. Partnerships are unlikely to succeed unless the top administrators of the participating institutions are committed to the program. In addition, partnerships should involve as many aspects of the participating uni-

versities, school districts and businesses as possible, and the partnership activities should be widely known within each of those institutions. A partnership that involves only an isolated faculty member or teacher or two is unlikely to have much impact.

Also, in evaluating whether an institution of higher education is likely to be able to carry out the proposed activities, NSF should be aware of whether the institution has been identified as a low-performing school under section 208 of the Higher Education Act of 1965.

The Act requires the Director to strive to involve a range of geographic areas in the partnership program. The partnership program is designed to highlight and support a variety of partnership models that could be widely copied. If such proliferation is to occur, the models must be designed for, and tested in a variety of locations, and in rural, suburban and urban areas. That does not mean, however, that partnerships must be awarded in every state.

The Committee also wants to ensure that partnerships increase the involvement of businesses in K–12 education. Therefore, the bill requires that at least half the partnerships include business partners. The Committee understands, though, that it may not be appropriate or possible for business to participate in every partnership because, for example, no appropriate business is near a participating school district, or because the particular activities to be undertaken by a partnership do not lend themselves to business participation. While NSF should strive to involve businesses in as many partnerships as possible, and must meet the 50 percent requirement, lack of business participation should never automatically disqualify a proposal.

The Committee wants to ensure that the partnerships are closely evaluated and that information about successful partnerships is widely disseminated. The Committee stresses the importance of in-depth, quantitative assessments of the partnerships. The assessments should use common metrics to facilitate useful comparisons, and should measure quantitative factors and not just attitudinal changes. Assessment should be an integral part of partnership activities. NSF should work with the Department of Education to ensure that the effectiveness of the partnerships funded under this Act can be compared with those created under H.R. 1.

SUBTITLE B—TEACHER RESEARCH SCHOLARSHIP PROGRAM

On March 7, 2001 the Committee held its first education hearing entitled "K–12th Grade Math and Science Education: The View from the Blackboard". One of of the themes the emerged from this hearing was that the classroom can become a very "isolating space" for young mathematics and science teachers.

The Partnerships Act contains several provisions that are designed to mitigate this isolation and reintegrate elementary and secondary school teachers into the wider professional world of mathematics and scientists. The Teacher Research Scholarship Program—modeled after successful programs developed by Cornell University, Columbia University and the Department of Energy—is designed to create opportunities for elementary and secondary mathematics and science teachers to actively engage in research projects without having to leave their teaching careers. The Committee expects that grant recipients will recruit teachers from a

wide array of urban, rural, and suburban school districts in order to maximize the impact of the program.

The Teacher Research Scholarship Program requires that participating institutions provide programming and guidance to teachers, as well as research opportunities, and allows up to 25 percent of each grant to be used for programming. The Committee expects that grant awardees will contribute some of their own resources to programming, as well. (The remainder of the grant money is for the scholarships, which are more exclusively a federal responsibility.)

Programming is essential to the success of the scholarship program. Programming should give teachers the background to understand the nature and implications of the research they are conducting, should deepen their understanding of the field in which they are conducting research, should help them determine how they can integrate their research experiences into their teaching, should allow them to interact with other teachers and research institutions. The Committee intends that the quality of programming be a major factor in determining grant awards.

TITLE II—NATIONAL SCIENCE, MATHEMATICS, ENGINEERING AND TECHNOLOGY EDUCATION DIGITAL LIBRARY

In 1994 NSF, the National Aeronautics and Space Administration, and the Defense Advanced Research Projects Agency initiated the National Digital Library Initiative (DLl). This initiative funds research necessary to support the development of the next generation of digital libraries, to advance the use and usability of globally distributed, networked information, and to encourage existing and new users to focus on developing innovative applications and educational materials. The National Science, Mathematics, Engineering and Technology Education Digital Library (Digital Library), supported by NSF as part of the initiative, also supports research on the long-term social, behavioral and economic implications of and effects of new digital libraries.

In 1998 the National Research Council, at the request of the National Science Board, convened a workshop to explore ways the Digital Library could best support the efforts of elementary and secondary school teachers to improve student achievement. The workshop participants noted that a successful digital library would "differ from a traditional library in being not only used but created by groups of people. Such a library would be constructed, collected, and organized by a community of users."

Building on the recommendations derived from the workshop, the Act authorizes NSF to award grants to institutions of higher education or other qualified entities to expand the Digital Library to address the special needs of elementary and secondary mathematics and science teachers. The expanded program may award grants to: (1) coordinate and manage the library's core collections and services and to develop the library's central portal; (2) develop, aggregate and manage a subset of the library's educational content within a coherent theme or specialty (e.g., earth science); and, (3) develop services which support users, collection providers, and which enhance the impact, efficiency, and value of the library. The Committee anticipates that the Digital Library will enable elementary and secondary teachers—including those most geographically

isolated—to share experiences, develop solutions to common problems and locate high quality educational materials and resources.

The Committee believes that, while the Internet is a source of a great deal of information of potential value to teachers, the abundance of individual web sites and the lack of quality assurance renders this information of little use to teachers. The Digital Library will utilize two mechanisms to ensure that educational resources and materials accessible through the library are accurate, effective, and relevant. First, resources and materials must be demonstrated to be accurate and effective through peer review prior to being made accessible through the Digital Library. Second, the Library will provide a forum through which elementary and secondary mathematics and science teachers can continuously review, critique, and improve upon materials and resources made accessible through the library. Teachers themselves will have an opportunity to actively review and shape the content of the library.

Some of the material that is accessible through the digital library will have been developed and evaluated with funds made available through this Act. The Committee is aware of excellent work to digitize high quality instructional resources that is already being done by non-profit entities like WGBH of Boston and WETA of Washington, D.C. The Committee expects that the Director will also draw upon the expertise of these and other qualified organizations and support their efforts to expand the content that is available through the Digital Library.

The Committee is also aware that many private sector entities are attempting to create Internet portals to educational teaching modules, curricular materials and practices. The Digital Library must be designed and implemented in a way that does not impede continued efforts to provide such resources and which encourages the healthy private sector competition necessary to ensure the efficient development of quality resources.

TITLE III—STRATEGIC EDUCATION RESEARCH PROGRAM, SUBTITLE A—CENTERS

The education of our nation's children in grades K–12 consumes approximately 7 percent of GDP; less than 0.03 percent of that is invested in research on what educational techniques actually work or on methods to improve teaching. In 1997, the President's Committee of Advisors on Science and Technology (PCAST) recommended that the nation's education research investment be increased to 0.5 percent and that educational hypotheses be subjected to appropriately rigorous evaluation involving large numbers of children in authentic classroom environments.

In 1998, the National Research Council convened an expert panel to evaluate new developments in the science of learning and the relevance of these basic science findings to education. The Committee believes that many of the panel's recommendations, summarized in the report How People Learn: Brain, Mind, Experience and School, could make a significant impact on the problems facing the nation's K–12 classrooms. Among the recommendations made by the panel were to develop research questions based on problems of consequence to classroom teachers; to find ways to convert research knowledge into effective instructional methods; and to support interdisciplinary collaborations of science and education research-

ers and practitioners. A subsequent document, How People Learn: Bridging Research and Practice, further emphasized the need to support "use-inspired" research focused on issues of importance to teaching and learning.

Title III of this Act implements the recommendations of the National Research Council through the establishment of four interdisciplinary research centers, each focused on a significant problem of importance to classroom educators. The Director is instructed to consult with the National Academy of Science to select the research focus of each of the centers, based on the current needs of the education practitioners. The Committee strongly believes that the focus of each center on a particular research area—a strategic research effort—is critical to the success of the program. Failure to identify a clear strategic focus will result in activities that spread the research effort too thinly by trying to answer too many different questions.

The Committee believes that the centers must have two key characteristics to succeed. The first is a commitment to interdisciplinary research. Each center must bring together researchers from a wide variety of fields. Progress in understanding teaching and learning is most likely to be made at the intersection of differing disciplines.

The second is a commitment to reducing research findings to educational practice. Too often, new insights into teaching and learning have no impact in the classroom either because teachers are entirely unaware of them or have no idea how to incorporate them into classroom practice. The centers must be designed to overcome such barriers. The centers can ensure the relevance of their research results in a variety of ways, including setting up partnerships with particular schools or teachers. The Committee intends that a major determinant in awarding grants under this Title will be the ability of a proposed center to reduce its research results to practice and to test and disseminate its recommended practices. Moreover, practices should be tested in a variety of schools—urban, suburban and rural—serving a variety of demographic groups.

The Committee recognizes the central, if intangible, role that motivation plays in the implementation of successful mathematics and science education reform programs. Successful school leaders motivate teachers to actively participate in professional development programs and to use new educational techniques and materials. Similarly, successful teachers motivate students and their parents to actively pursue not only the learning opportunities available in school but those available after school as well. The Committee expects that the education research program will examine what is known by cognitive science about motivation and develop ways that this knowledge can more effectively be transferred to the classroom.

TITLE III, SUBTITLE B—STRATEGIC EDUCATION RESEARCH PROGRAM—FELLOWSHIPS

On May 10, 2001, the Subcommittee on Research of the Committee on Science held a hearing entitled "Classrooms as Laboratories: The Science of Learning Meets the Practice of Teaching." At this hearing the witnesses testified that the gap between education

research and practice is driven primarily by the following factors: (1) teachers do not have the time or resources to read the research literature; (2) research findings are not written in ways that are easily understandable or translatable to their daily classroom practice; and (3) researchers often lack any experience teaching in the K–12 setting and do not adequately understand the demands or limitations of this environment. The Committee believes it is important to actively encourage the participation of teachers in education research projects to ensure the relevance of the research to actual classrooms, to facilitate the use of their classrooms for evaluation of materials and practices, and to enable teachers to make distinctions between research-based methods and curricula and those which are without a research foundation. The Partnerships Act authorizes grants to institutions of higher education to provide fellowships to encourage teachers to become part of the research enterprise.

The Education Research Teacher Fellowship Program requires that participating institutions provide programming and guidance to teachers, as well as research opportunities, and allows up to 25 percent of each grant to be used for programming. The Committee expects that grant awardees will contribute some of their own resources to programming, as well. (The remainder of the grant money is for the fellowships, which are more exclusively a federal responsibility.)

Programming is essential to the success of the fellowship program. Programming should give teachers the background to understand the nature and implications of the research they are conducting, should deepen their understanding of the field in which they are conducting research, should help them determine how they can integrate their research experiences into their teaching, should allow them to interact with other teachers conducting research, and should help build continuing relationships between teachers and research institutions. The Committee intends that the quality of programming be a major factor in determining grant awards.

## TITLE IV—ROBERT NOYCE SCHOLARSHIP PROGRAM

The single most important step needed to improve mathematics and science education is to get smarter, better prepared teachers into the classroom. As of now, we are not even producing enough qualified mathematics and science teachers for our elementary and secondary classrooms. A 1994 survey of school administrators revealed that 50% of all schools with openings for teachers in the physical or life sciences had difficulty filling the positions. The same was true for 40% of the schools with openings in mathematics.

As a result, school districts have been forced to hire teachers inadequately prepared for the classroom. In 1994, 21% of all public school teachers lacked even a minor in their primary field and 59% had less than a minor in their secondary teaching field. The problem is even greater in mathematics and science. The National Commission on Teaching and America's Future, a non-partisan commission established with initial funding from the Rockefeller Foundation and the Carnegie Corporation of New York, reported in 1996 that out-of-field teachers teach 56% of all high school students tak-

ing physical science and 27% of high school students taking mathematics.

Recognizing that the most powerful predictor of higher student achievement in mathematics and science is a fully certified teacher who majored in the field being taught, the Committee believes that it is critical that steps be taken to encourage the brightest of our Nation's mathematics, science and engineering majors to pursue careers as elementary and secondary mathematics and science teachers. The Noyce Scholarship Progam—named for Robert Noyce, an inventor of the integrated circuit—represents an effort to attract these students to careers in teaching by offering them scholarships in exchange for a commitment to teach for two years for each year of scholarship received.

This program is designed to attract a diverse, talented group of science, mathematics, engineering and technology students to careers as high performing elementary and secondary school teachers. The Director should select institutions of higher education that have demonstrated their ability to attract talented science, mathematics, engineering and technology majors and minors from diverse backgrounds and have a plan to recruit and prepare them for successful teaching careers. The Committee recognizes that there are many measures of academic proficiency and success but believes that scholarship recipients should maintain a grade point average of at least 3.0 and should be among the top performing students in the departments.

The Noyce Scholarship Program is intended to do more than distribute scholarship money to students. A critically important feature of this Title is that participating universities must provide programming to enable scholarship recipients to become skilled teachers and to encourage them to continue teaching once their service requirement has been fulfilled. Programming should be provided both while scholarship recipients are undergraduates and while they are fulfilling their service requirement. Programming could include providing classes toward teaching certification, offering student teaching opportunities, providing students with K–12 teachers as mentors, and bringing scholarship recipients back to campus for annual conferences while they are teaching. The Committee intends that the quality of programming to be offered to scholarship recipients be a major factor in determining grant awards.

The Committee also believes that a large number of professional mathematicians, scientists, and engineers would like to teach but lack the teaching credentials required to make the transition into a teaching career. The Noyce Scholarship Program will offer stipends to these professionals to enable them to take the coursework they need to become certified teachers. As in the case of the scholarship program, the Committee believes that it is not enough to encourage mathematicians, scientists, and engineers to enter careers in teaching. Academic programming must be provided by the institution of higher education during the early formative years of teaching to ensure that these new teachers not only enter, but also remain productive members of, the teaching profession.

The President has proposed a loan forgiveness program that provides financial incentives to mathematics and science majors after they graduate to encourage them to enter careers in teaching. The

Noyce Scholarship Program is complementary to this effort while being more comprehensive in scope. The Scholarship Program actively recruits students prior to graduation, prepares them for careers in teaching, and provides the support needed to enable them to succeed during their early years of service. The Committee believes that the combination of the Noyce Scholarship Program and the economic incentive of loan forgiveness will provide powerful new tools for encouraging our best students to become high performing teachers.

In order for the full benefit of the Noyce Scholarship Program (with or without other recruitment incentive programs) to be realized, participating institutions of higher education must develop and implement high quality professional development programs, closely follow the post-graduation classroom performance of their scholarship recipients, and collect scholarship funds from students who fail to fulfill their service obligations. The Committee recognizes that to be effective these activities require significant investments in program and administration at participating institutions and has authorized funds to cover the costs of these activities.

The Noyce Scholarship Program requires that scholarship recipients serve for two years as an elementary or secondary science or mathematics teacher for each year of scholarship received. The Committee recognizes that circumstances can arise in which this service requirement would pose an undue hardship upon the individual or their family and has authorized NSF to waive or suspend the service or repayment requirements under these circumstances. The Committee assumes that such circumstances would be rare. They might include temporary or permanent disability, required military service, or overseas deployment with a spouse serving in the armed forces or U.S. Foreign Service.

TITLE V—REQUIREMENTS FOR RESEARCH CENTERS

One of the primary objectives of this Act is to ensure that NSF and institutions of higher education are fully engaged in improving elementary and secondary mathematics and science education. Title V of the Act requires the Director of NSF to ensure that every new center grant that is awarded by the Foundation contains an elementary or secondary school mathematics or science education reform component. It is the Committee's expectation that this requirement will encourage all applicants for center grants to think more closely about the ways that they can aid education reform activities in their local communities and across the nation.

TITLE VI—EDUCATIONAL TECHNOLOGIES RESEARCH

The Higher Education Amendments of 1998 authorized the establishment of the Web-Based Education Commission to assess the educational software available in retail markets for use by secondary and postsecondary students. The Commission called for federally sponsored education research focused on "high payback targets of educational opportunity, where present understanding of learning theory supports technological innovations." The Commission also endorsed previous recommendations of the President's Committee of Advisors on Science and Technology for a large-scale program of empirical research to identify the technology-based edu-

cational practices and approaches that produce improvements in student learning.

Title VI of the Partnerships Act responds to these recommendations by authorizing a program to establish research centers at institutions of higher education to evaluate and improve the use of information technologies in elementary and secondary mathematics and science education. The objectives of this program are to develop methods to measure the effectiveness of applications of educational technology in improving student achievement; identify the variables that influence the effectiveness of educational technologies in a variety of educational settings; and identify educational applications of information technology that contribute to increased student achievement.

The Committee intends that the research provide information that will inform the decisions of educators on which educational approaches and techniques based on the use of information technology work in classrooms and on the key factors that affect educational outcomes for particular educational settings. The Committee stresses the quantitative nature of the results sought in terms of student performance and the importance of widespread dissemination of the results of the research.

TITLE VII—MISCELLANEOUS PROVISIONS

The Web-Based Education Commission also called attention to the lack of support for teachers in the use of educational technologies, including both intellectual support in how to integrate technology into classroom instruction and technical support for the equipment. Their report, The Power of the Internet for Learning, indicates that only about 10 percent of teachers work in what could be described as a high quality technologically supported environment. Even for the 20 percent of schools with district technology coordinators, the Commission's report cites surveys showing that the average time to fix a technical problem is two days. The program created by section 706 is intended to develop local centers to provide assistance to schools in selecting and maintaining appropriate information technologies and to help train teachers in how to use technology in the classroom.

Further, the Committee believes that opportunities to bring the technical expertise of graduate and undergraduate students to teachers, as authorized under section 101(c)(3), should be exploited whenever feasible. Computer literate post secondary students could provide valuable assistance to teachers in how to use technology and how to keep it working. Similarly, the educational technology assistance program created by section 706 is intended to develop local centers to provide assistance to schools in selecting and maintaining appropriate information technologies and to help train teachers in how to use technology in the classroom.

The recent report of the Congressional Commission on the Advancement of Women and Minorities in Science, Engineering and Technology Development points out that women and minorities represent the fastest growing segments of the nation's workforce but comprise only a small fraction of scientists and engineers. Nearly 70 percent of the S&E workforce consists of white males, while approximately 15 percent are white females and only about 5 percent are African Americans or Hispanics. The future needs of

the economy cannot be met unless all segments of society are fully represented in science and engineering careers. Two provisions of the bill are especially designed to address this issue.

Section 701 of the bill establishes a pilot program to provide federal funding for improvements in science and mathematics education programs in schools in economically disadvantaged areas to leverage private sector funding for undergraduate scholarships and summer internships for talented students from these schools who go on to pursue science and engineering studies. The Committee intends for NSF to make competitive awards to schools that demonstrate the greatest economic need and that are most successful in obtaining commitments from the private sector for substantial non-federal funding for scholarships and educational support activities. The Committee also expects NSF to carefully evaluate the effectiveness of the program, particularly in terms of the number of participating students who obtain undergraduate degrees in science, mathematics and engineering.

Section 702 of the bill authorizes funding for outreach grants first authorized, but never funded, by section 3(c)(2) of the Scientific and Advanced-Technology Act of 1992. These grants were intended to support collaborations between 2-year colleges and secondary schools to recruit and help prepare students for undergraduate courses in science, mathematics and technology. The Committee expects NSF to give priority consideration in making these awards to proposals that involve secondary schools with a majority of students from groups that are underrepresented in the science, mathematics and engineering workforce.

Title VII also authorizes two activities that NSF can clearly undertake under its existing authority. The Committee expects NSF to carry out these activities regardless of whether they are included in the final version of this Act. One activity is the awarding of competitive, merit-reviewed grants for the development of educational materials on energy production and use, energy conservation, and renewable energy for use in elementary and secondary schools. The other is the awarding of a $10 million grant to a consortium composed of associate-degree granting colleges for the purpose of carrying out a pilot project to encourage women, minorities and persons with disabilities to enter and complete programs in mathematics, science, engineering and technology.

## IX. Cost Estimate

Rule XIII, clause 3(d)(2) of the House of Representatives requires each committee report accompanying each bill or joint resolution of a public character to contain: (1) an estimate, made by such committee, of the costs which would be incurred in carrying out such bill or joint resolution in the fiscal year in which it is reported, and in each of the five fiscal years following such fiscal year (or for the authorized duration of any program authorized by such bill or joint resolution, if less than five years); (2) a comparison of the estimate of costs described in subparagraph (1) of this paragraph made by such committee with an estimate of such costs made by any Government agency and submitted to such committee; and (3) when practicable, a comparison of the total estimated funding level for the relevant program (or programs) with the appropriate levels under current law. However, House Rule XIII, clause 3(d)(3)(B)

provides that this requirement does not apply when a cost estimate and comparison prepared by the Director of the Congressional Budget Office under section 402 of the Congressional Budget Act of 1974 has been timely submitted prior to the filing of the report and included in the report pursuant to House Rule XIII, clause 3(c)(3). A cost estimate and comparison prepared by the Director of the Congressional Budget Office under section 402 of the Congressional Budget Act of 1974 has been timely submitted to the Committee on Science prior to the filing of this report and is included in Section X of this report pursuant to House Rule XIII, clause 3(c)(3).

Rule XIII, clause 3(c)(2) of the House of Representatives requires each committee report that accompanies a measure providing new budget authority (other than continuing appropriations), new spending authority, or new credit authority, or charges in revenues or tax expenditures to contain a cost estimate, as required by section 308(a)(1) of the Congressional Budget Act of 1974 and, when practicable with respect to estimates of new budget authority, a comparison of the total estimated funding level for the relevant program (or programs) to the appropriate levels under current law. H.R. 1858 does not contain any new budget authority, credit authority, or changes in revenues or tax expenditures. Assuming that the sums authorized under the bill are appropriated, H.R. 1858 does authorize additional discretionary spending, as described in the Congressional Budget Office report on the bill, which is contained in Section X of this report.

## X. Congressional Budget Office Cost Estimate

U.S. Congress,
Congressional Budget Office,
*Washington, DC, June 21, 2001.*

Hon. Sherwood L. Boehlert,
*Chairman, Committee on Science,*
*House of Representatives, Washington, DC.*

Dear Mr. Chairman: The Congressional Budget Office has prepared the enclosed cost estimate for H.R. 1858, the National Mathematics and Science Partnerships Act.

If you wish further details on this estimate, we will be pleased to provide them. The CBO staff contact is Julie Middleton.

Sincerely,

Barry B. Anderson
(For Dan L. Crippen, Director).

Enclosure.

*H.R. 1858—National Mathematics and Science Partnerships Act*

Summary: H.R. 1858 would authorize the appropriation of approximately $1.5 billion over the 2002–2006 period and $100 million after 2006 for education initiatives of the National Science Foundation (NSF). This bill would authorize NSF to implement several new grant and teacher scholarship programs related to mathematics and science education, expand the NSF's digital library of elementary and secondary education resources, and conduct several studies related to improving technology in education. Most of the money authorized by this bill would fund a program

to establish partnerships between university researchers and local school districts to improve the instruction of elementary and secondary science education.

Assuming appropriation of the authorized amounts, CBO estimates that implementing H.R. 1858 would result in outlays of about $1.1 billion over the 2002–2006 period and an additional $459 million after 2006. H.R. 1858 would not affect direct spending or receipts; therefore, pay-as-you-go procedures would not apply. H.R. 1858 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA).

Estimated cost to the Federal Government: The estimated budgetary impact of H.R. 1858 is shown in the following table. The costs of this legislation fall within budget function 250 (general science, space, and technology).

| | By fiscal year, in millions of dollars— | | | | | |
|---|---|---|---|---|---|---|
| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
| SPENDING SUBJECT TO APPROPRIATION | | | | | | |
| Spending under current law: | | | | | | |
| Budget authority | 25 | 0 | 0 | 0 | 0 | 0 |
| Estimated outlays | 3 | 10 | 8 | 1 | 0 | 0 |
| Proposed changes: | | | | | | |
| Estimated authorization level | 0 | 317 | 314 | 314 | 299 | 299 |
| Estimated outlays | 0 | 42 | 186 | 273 | 290 | 290 |
| Spending under H.R. 1858: | | | | | | |
| Estimated authorization level [1] | 25 | 317 | 314 | 314 | 299 | 299 |
| Estimated outlays | 3 | 52 | 194 | 274 | 290 | 290 |

[1] $25 million was appropriated in 2001 for the digital library.

Basis of estimate: For this estimate, CBO assumes that H.R. 1858 would be enacted in fiscal year 2001, and that the amounts authorized will be appropriated each year. In addition, based on information from NSF, CBO estimates that H.R. 1858 would authorize the appropriation of $3 million in 2002 for studies related to the use of technology in education. Estimates of outlays for all activities are based on information from NSF and historical spending patterns for similar programs.

Pay-as-you-go considerations: None.

Intergovernmental and private-sector impact: H.R. 1858 contains no intergovernmental or private-sector mandates as defined in UMRA. The bill would authorize the Director of NSF to establish grant programs that would provide about $1.5 billion over five years; any costs incurred by state and local governments to apply for and administer such grants would result from complying with conditions of aid. The grants would benefit state and local governments, including local school districts and public universities, by assisting them in improving mathematics, science, and technology education.

Estimate prepared by: Federal costs: Julie Middleton; impact on State, local, and tribal governments: Elyse Goldman; impact on the private sector; Lauren Marks.

Estimate approved by: Robert A. Sunshine, Assistant Director for Budget Analysis.

## XI. Compliance With Public Law 104–4

H.R. 1858 contains no unfunded mandates.

## XII. Committee Oversight Findings and Recommendations

Rule XIII, clause 3(c)(1) of the House of Representatives requires each committee report to include oversight findings and recommendations required pursuant to clause 2(b)(1) of rule X. The Committee on Science's oversight findings and recommendations are reflected in the body of this report.

## XIII. Constitutional Authority Statement

Rule XIII, clause 3(d)(1) of the House of Representatives requires each report of a committee on a bill or joint resolution of a public character to include a statement citing the specific powers granted to the Congress in the Constitution to enact the law proposed by the bill or joint resolution. Article I, section 8 of the Constitution of the United States grants Congress the authority to enact H.R. 1858.

## XIV. Federal Advisory Committee Statement

H.R. 1858 does not establish nor authorize the establishment of any advisory committee.

## XV. Congressional Accountability Act

The Committee finds that H.R. 1858 does not relate to the terms and conditions of employment or access to public services or accommodations within the meaning of section 102(b)(3) of the Congressional Accountability Act (Public Law 104–1).

## XVI. Statement on Preemption of State, Local, or Tribal Law

This bill is not intended to preempt any state, local, or tribal law.

## XVII. Changes in Existing Law Made by the Bill, As Reported

In compliance with clause 3(e) of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italic, existing law in which no change is proposed is shown in roman):

### SECTION 3 OF THE SCIENTIFIC AND ADVANCED-TECHNOLOGY ACT OF 1992

**SEC. 3. SCIENTIFIC AND TECHNICAL EDUCATION.**

(a) * * *

* * * * * * *

*(d) Educational Technology Assistance.—*

*(1) In general.—The Director is authorized to make awards on a competitive, merit-reviewed basis to associate-degree granting colleges, bachelor-degree granting institutions, or education service agencies (or consortia thereof) to establish centers to assist elementary and secondary schools in the use of information technology for mathematics, science, or technology instruction.*

*(2) Activities.—Activities of centers funded under this subsection may include—*

*(A) helping schools evaluate their need for information technology;*

*(B) training teachers on how to best use information technology in instruction; and*

*(C) providing other information and training to help schools and teachers ensure that they have access to appropriate information technologies and are using them to maximum advantage.*

*(3) APPLICATION.—An application to receive funds under this subsection shall include, at a minimum—*

*(A) a description of the services that will be provided to schools and teachers;*

*(B) a list of the schools expected to be served;*

*(C) a description of how the applicant will draw on the expertise of its faculty and students to assist schools and teachers; and*

*(D) a description of how the applicant will operate the program after funding made available by this subsection has expired.*

*(4) SELECTION.—In evaluating applications submitted under paragraph (3), the Director shall consider, at a minimum—*

*(A) the ability of the applicant to effectively carry out the program;*

*(B) the number of schools and students who would be served and their need for assistance;*

*(C) the extent to which the applicant has worked with participating schools to ensure that priority problems would be addressed by the assistance provided under this subsection; and*

*(D) the ability of the applicant to continue to provide assistance after funding under this subsection has expired.*

*(5) AWARDS.—(A) The Director shall ensure, to the extent practicable, that the program established by this subsection assists schools in rural, suburban, and urban areas.*

*(B) No institution shall receive funds under this subsection for more than three years.*

*(6) REPORT.—Not later than April 1, 2005, the Director shall provide a report to Congress assessing the success of the program funded under this subsection and the need of schools for continued assistance, and, based on the experience with the program, recommending ways information technology assistance to schools could be made more broadly available.*

*(7) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the National Science Foundation to carry out this subsection $5,000,000 for each of the fiscal years 2002 through 2004.*

*(e) LEARNING COMMUNITY CONSORTIUM.—The Director is authorized to provide to a consortium composed of associate-degree granting colleges a grant in the amount of $10,000,000 for the purpose of carrying out a pilot project to encourage women, minorities and persons with disabilities to enter and complete programs in mathematics, science, engineering and technology.*

**[**(d)**]** *(f)* COORDINATION WITH OTHER FEDERAL DEPARTMENTS.—In carrying out this section, the Director shall consult, cooperate, and coordinate, to enhance program effectiveness and to avoid du-

plication, with the programs and policies of other relevant Federal agencies. In carrying out subsection (c), the Director shall coordinate activities with programs receiving assistance under part B of title I of the Higher Education Act of 1965.

[(e)] *(g)* LIMITATION ON FUNDING.—To qualify for a grant under this section, an associate-degree-granting college, or consortium thereof, shall provide assurances adequate to the Director that it will not decrease its level of spending of funds from non-Federal sources on advanced scientific and technical education and training programs.

[(f)] *(h)* FUNCTIONS OF THE DIRECTOR.—In carrying out this Act, the Director shall—

(1) * * *

* * * * * * *

[(g)] *(i)* DEFINITIONS.—As used in this section—

(1) * * *

* * * * * * *

## XVIII. COMMITTEE RECOMMENDATIONS

On June 13, 2001, a quorum being present, the Committee on Science favorably reported the National Mathematics and Science Partnerships Act, by a voice vote, and recommends its enactment.

## XIX. STATEMENT OF GENERAL PERFORMANCE GOALS AND OBJECTIVES

Pursuant to clause (3)(c) of House rule XIII, the goals of H.R. 1858 are to improve the instruction of science, mathematics, engineering and technology education in elementary and secondary schools, increase the number of mathematics, science or engineering majors who pursue teaching careers, and to increase the performance of American students to internationally competitive levels.

The Committee requires that all of the programs authorized under the Partnerships Act be awarded on the basis of a competitive, merit-review process. This process is expected to ensure that only those projects that hold the most promise for contributing to state and local education reform efforts will receive funding. In addition, the Act subjects each project and program to rigorous accountability and assessment requirements. Each project and program must incorporate performance benchmarks and assessments in the design of the project or program to ensure that the project or program will be able to identify methods and materials that improve student achievement as well as identify those that impede student achievement. One of the hallmarks of cutting edge scientific research is that one learns as much or more from negative or unexpected outcomes as from successful or anticipated results. The Committee expects that lessons from projects or programs that do not meet initial expectations will also be widely disseminated and incorporated into subsequent projects and programs.

Title I of H.R. 1858 authorizes the Director of NSF to award grants to institutions of higher educations or eligible non-profit organizations to establish mathematics and science partnership programs. The program is designed to test a diverse range of proposals

with an equally diverse range of objectives. In general, however, the program is expected to contribute to the reform of elementary and secondary mathematics and science curricula, expand the number of high quality professional development programs for teachers, improve the quality of classroom instruction, and to develop partnership models that can serve as the foundation for state and local reform activities.

Title II of H.R. 1858 authorizes the Director of NSF to expand the National Science, Mathematics, Engineering and Technology Education Digital Library to provide timely and continuous dissemination of K–12 science, mathematics, engineering, and technology educational resources, materials, practices, and policies through the internet and other digital technologies. The performance objective of this program is to improve the quality of classroom instruction by increasing the access of mathematics and science teachers to peer reviewed resources and providing a forum through which they can exchange ideas, share experiences, and contribute to the continuous improvement of educational materials

Title III of the Act authorizes the Director of NSF to establish four multidisciplinary education research centers. The general performance objective for this program is to stimulate multidisciplinary research that bridges the current gap between cognitive science and education research and generates results that are readily transferable to the classroom.

Title IV of the Partnerships Act authorizes the establishment of the Robert Noyce Scholarship Program. The objective of this program is to encourage talented mathematics, science, engineering, or technology majors, who would otherwise not pursue careers as elementary or secondary mathematics or science teachers, to enter and remain in careers as high performing teachers. Title IV also authorizes a stipend program to encourage mathematics, science, or engineering professionals to pursue careers as teachers. The objective of this program is to encourage talented professionals, who would otherwise not pursue careers as elementary or secondary mathematics or science teachers, to undertake to careers as high performing teachers.

Title V of the Act requires the Director of NSF to ensure that all new center grants awarded by the Foundation include an elementary and secondary mathematics or science education program element. The performance objective of this program is to encourage broader participation by institutions of higher education in elementary and secondary mathematics and science education reform activities.

Title VI of the Act authorizes a program to establish research centers at institutions of higher education to evaluate and improve the use of information technologies in elementary and secondary mathematics and science education. The objectives of this program are to develop methods to measure the effectiveness of applications of educational technology in improving student achievement; identify the variables that influence the effectiveness of educational technologies in a variety of educational settings; and identify educational applications of information technology that contribute to increased student achievement.

Title VII of the Performance Act authorizes the Director to establish mathematics and science proficiency partnerships. The objec-

tives of this program are to encourage the development of partnerships between schools and businesses that improve the quality of elementary and secondary science and mathematics instruction and to encourage economically disadvantaged students to enroll in college.

Section 703 also authorizes the Director to award a grant to a consortium of community colleges for a pilot program testing ways to encourage women, minorities, and persons with disabilities to enter and complete programs in science, mathematics, engineering, and technology (SMET). The goal of this program is to identify and demonstrate effective ways to attract these students to SMET programs and to improve their retention and graduation rates.

## XX. Exchange of Committee Correspondence

COMMITTEE ON SCIENCE,
*Washington, DC, June 25, 2001.*

Hon. JOHN BOEHNER,
*Chairman, House Committee on Education and the Workforce, Rayburn House Office Building, Washington, DC.*

DEAR CHAIRMAN BOEHNER: Thank you for your letter of June 26, 2001 regarding H.R. 1858, the National Mathematics and Science Partnerships Act.

I appreciate your waiving your Committee's right to a referral on this bill so that it can move expeditiously to the floor. I recognize your Committee's jurisdiction in this area and will support any request you may make to have conferees on H.R. 1858 or similar legislation.

The exchange of letters between our two committees will be included in the Committee report on H.R. 1858 and will be made part of the floor record.

Sincerely,

SHERWOOD L. BOEHLERT,
*Chairman.*

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COMMITTEE ON EDUCATION
AND THE WORKFORCE,
*Washington, DC, June 26, 2001.*

Hon. SHERWOOD L. BOEHLERT,
*Chairman, Committee on Science, Rayburn HOB, Washington, DC.*

DEAR CHAIRMAN BOEHLERT: Thank you for working with me regarding your bill, H.R. 1858, the "National Mathematics and Science Partnerships Act", which was referred to the Committee on Science and in addition the Committee on Education and the Workforce and ordered favorably reported by your Committee on June 13, 2001. I understand your desire to have this legislation considered expeditiously by the House; hence, I do not intend to hold a hearing or markup on this legislation.

In agreeing to waive consideration by our Committee, I would expect you to agree that this procedural route should not be construed to prejudice the Committee on Education and the Workforce's jurisdictional interest and prerogatives on this or any similar legislation and will not be considered as precedent for consideration of matters of jurisdictional interest to my Committee in

the future. I would also expect your support in my request to the Speaker for the appointment of conferees from my Committee with respect to matters within the jurisdiction of my Committee should a conference with the Senate be convened on this or similar legislation.

I would appreciate your including our exchange of letters in your Committee's report to accompany H.R. 1858. Again, I thank you for working with me in developing this legislation and I look forward to working with you on these issues in the future.

Sincerely,

JOHN BOEHNER,
*Chairman.*

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COMMITTEE ON SCIENCE,
*Washington, DC, July 9, 2001.*

Hon. BILLY TAUZIN,
*Chairman, Committee on Energy and Commerce,*
*House of Representatives, Washington, DC.*

DEAR CHAIRMAN TAUZIN: Thank you for your letter regarding H.R. 1858, the "National Mathematics and Science Partnership Act." Although the Parliamentarian did not refer H.R. 1858 to the Committee on Energy and Commerce, I understand your concern with the bill as amended.

While sec. 704 of Title VII of H.R. 1858, "Study of Broadband Network Access for Schools and Libraries," requires the Director of the National Science Foundation to conduct a study of high-speed, large bandwidth capacity access to all public elementary and secondary schools and libraries, it is not the intent of the Committee on Science to encroach upon your Committee's jurisdiction in the broadband area. Sec. 704 merely requires a study of network access, it does not pierce the Energy and Commerce Committee's telecommunications jurisdiction.

The Committee on Science intends to bring H.R. 1858 to the floor under suspension of the rules, and would therefore not be subject to amendments. If, however, during future Congressional deliberations of H.R. 1858, the bill is altered to actually include subject matter falling within the Energy and Commerce Committee's jurisdiction, we will work with your Committee to address those issues of concern, including the honoring of your request for conferees should any subsequent version contain a provision that falls within your jurisdiction. We do not anticipate any encroachment into your jurisdiction and will resist effort to do so.

I will include the exchange of letters between our Committees as part of the record. Thank you for your cooperation in this matter.

Sincerely,

SHERWOOD L. BOEHLERT,
*Chairman.*

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COMMITTEE ON ENERGY AND COMMERCE,
*Washington, DC, July 9, 2001.*

Hon. SHERWOOD L. BOEHLERT,
*Chairman, Committee on Science, House of Representatives, Rayburn House Office Building, Washington, DC.*

DEAR CHAIRMAN BOEHLERT: I am writing with regard to H.R. 1858, the National Mathematics and Science Partnership Act. As you know, H.R. 1858 was ordered reported, amended, by the Committee on Science on June 13, 2001.

During the Committee on Science markup, section 704 of title VII was added to the bill. This section added a study to be done by the Director of the National Science Foundation concerning broadband network access for schools and libraries. As you are aware, under Clause 1(f) of Rule X of the Rules of the House, the Committee on Energy and Commerce has jurisdiction over the regulation of interstate and foreign communications, including broadband network access.

I recognize your desire to bring this legislation before the House in an expeditious manner. Accordingly, I will not exercise the Committee's right to seek a referral on any provision that may be within our jurisdiction. By agreeing to waive its consideration of the bill, however, the Energy and Commerce Committee does not waive any jurisdiction over H.R. 1858, or any provisions that may be added to the legislation. In addition, the Energy and Commerce Committee reserves its authority to seek conferees on any provisions of the bill that are within its jurisdiction during any House-Senate conference that may be convened on this legislation. I ask for your commitment to support any request by the Energy and Commerce Committee for appropriate conferees on H.R. 1858 or similar legislation.

I request that you include this letter as a part of the Committee's report on H.R. 1858 and as part of the Record during consideration of the legislation on the House floor.

Thank you for your attention to these matters.

Sincerely,

W.J. "BILLY" TAUZIN,
*Chairman.*

XXI. PROCEEDINGS OF SUBCOMMITTEE MARKUP

# H.R. 1858, NATIONAL MATHEMATICS AND SCIENCE PARTNERSHIPS ACT

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**JUNE 7, 2001**

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE,
SUBCOMMITTEE ON RESEARCH,
*Washington, DC.*

The Subcommittee met, pursuant to call, at 10:05 a.m., in room 2318 of the Rayburn Building, Hon. Nick Smith (chairman of the subcommittee) presiding.

Chairman SMITH. The Subcommittee on Research will come to order. Barry are you counting? Oh, shucks. One, two, three, four,

five. So we are really—have come to order then. Good morning. The Subcommittee on Research is meeting today to consider the following measures, two bills. One is H.R. 1858, the National Mathematics and Science Partnership Act, and H.R. 100, the National Science Education Act.

[Markup Notification follows:]

COMMITTEE ON SCIENCE,
SUBCOMMITTEE ON RESEARCH,
*Washington, DC, June 5, 2001.*

MEMORANDUM

To: All Members, Subcommittee on Research.
From: Nick Smith, Chairman.
Subject: Subcommittee Markup of H.R. 1858 and H.R. 100.

Pursuant to notice, the Subcommittee on Research, Committee on Science, intends to consider the following measures on Thursday, June 7th at 10:00 a.m. in Room 2318 of the Rayburn Building.

H.R. 1858, National Mathematics and Science Partnerships Act; and,

H.R. 100, National Science Education Act.

Should you have amendments to these measures, please hand deliver them to: Natalie Palmer, B–374 RHOB, no later than 10:00 a.m. on Wednesday, June 6th. In keeping with Committee precedent, all amendments should be drafted by the Office of Legislative Counsel.

Attached are markup materials for your information. If you have any questions, please call Sharon Hays, Staff Director, or Natalie Palmer, Staff Assistant, at 5–7858.

Chariman SMITH. I would ask unanimous consent for the authority to recess the Subcommittee at any point and without objection it is so ordered.

Let me make a couple remarks and then we will turn it over to our esteemed Ranking Member and the Chairman of the Full Committee for remarks.

Today the Subcommittee meets to consider two bills that address an issue that I think most of us consider crucial to our national security and future prosperity. In fact, I have told the Vice-President of the Administration that I consider our performance in science and math education in K through 12 to probably be at least the second greatest national security threat to this nation. The education of our children, that our children receive a math and science education is extremely important.

We talk often on this Subcommittee of the important role that fundamental research plays in our current prosperity. We are in the midst of a technological revolution that has driven our economy, improved our productivity, and helped us live longer and healthier lives. A revolution fueled in large part by our past investment in research and development but this research and development is in turn enabled by the investment we make educating our children in math and science and the success of motivation in that education process.

The two bills that we consider today take important steps to manage that investment. The most recent results of the trends in mathematics and science study show that our efforts to improve math and science education have had some success but overall have been ineffective in really significantly raising the U.S. performance from its middle-of-the-pack position. And while there are some highlights, my own state of Michigan, for example, achieved the top U.S. scores in both math and science, might be a bright spot but even with Michigan's scores relatively compared to the G–

7 country's, not too impressive. We need to work harder to make these bright spots the norm and not the exception.

The President's plan to improve education, No Child Left Behind, I think highlights the importance of partnerships between the K through 12 system and institutions of higher education in leading the math and science and education reform effort.

The Chairman's bill, the first bill that we are going to consider today, H.R. 1858, the National Mathematics and Science Partnership Act, is the realization of this partnership plan. It is what has been suggested by the President of the United States, and I hope that we can conclude that in a way that the Administration is suggesting.

The centerpiece of the legislation, Title I, Mathematics and Science Education Partnerships, authorizes a competitive grant program at the National Science Foundation to enable institutions of higher learning to partner with the local school districts.

The bill authorizes the President's request of the 200 million per year for fiscal year 2002 through 2006. The bill includes a number of other provisions and—that relates to engineering and technology education and the digital library. This program and an additional fellowship program I hope we will adopt in the Manager's Amendment form the bulk of our own educational research legislation. The Strategic Education Research Program addresses the need to bridge the gap between basic research on learning and classroom practice.

And the bill authorizes the NSF-funded centers for research on learning and education improvement.

I want to thank Chairman Boehlert for working with me and other members of the Subcommittee in crafting this bill and for this—the effort of this Committee and the effort of the Chairman to make this come to fruition.

And the Chair, with your permission, Mr. Chairman, the Chair would ask our Ranking Member to make her comments and then we will come to you. Eddie Bernice Johnson.

Ms. JOHNSON. Thank you very much, Mr. Chairman. I am pleased that the Subcommittee is moving forward this morning to markup legislations, improve science and mathematics education in elementary and secondary schools.

I congratulate you for your efforts to bring this about and thank Chairman Boehlert for placing science education high on the agenda for the committee this year.

Over the past two Congresses the Science Committee has conducted a comprehensive series of hearings that have examined all aspects of K through 12 science and math education. I believe that the legislation we will consider today is well supported by the testimony we have received. It is now time to move it forward. The Democratic members of the Committee have separately developed several legislative proposals on science and math education.

In addition they joined Ranking Member Hall in developing a comprehensive education bill. That is H.R. 1693, which Mr. Hall introduced earlier this year. I am pleased that many of the programs and activities set out in these bills have been included in the Manager's Amendment of H.R. 1858, which we will soon take up.

This includes the Mathematics and Science Proficiency Partnership Act, which I have introduced in this and in the past two Congresses.

Mr. Chairman, we have been engaged in a collegial process to develop a bipartisan committee product in which I believe we may all take pride. I want to commend Chairman Boehlert and Chairman Smith for both of you and your willingness to work cooperatively with Democratic members and thank you for bringing up the legislation before the Subcommittee today. I look forward to seeing it reported to the Full Committee and to the House. Thank you.

Chairman SMITH. The Chair is glad to recognize the sponsor of the bill and the Chairman of our Science Committee.

Chairman BOEHLERT. Thank you very much, Mr. Chairman. This is an important day for this Committee because in addition to our normal work of having a positive impact on the shaping of public policy overall in the science arena, we have made it clear right from the beginning of this year that we are going to be players in the arena as we deal with shaping education, energy, and environmental policy. And today we are fulfilling a part of that commitment.

We are making up two excellent bipartisan bills that demonstrate the commitment we made at the beginning of the year that the Science Committee would be an important, productive contributor to the effort to improve education. Both these bills draw on the strengths of the National Science Foundation to shore up science and math education in ways that would be difficult for other agencies to accomplish. I think NSF is uniquely positioned to make a significant contribution.

The fundamental purpose of the bills is to insure that we are drawing on the expertise and resources of higher education and of businesses to improve K through 12 education. And in this instance I would urge my colleagues on the other side of the Capitol to take note of what we are doing here. The Manager's Amendment reflects a model, bipartisan agreement that improves the bill and incorporates aspects of legislation introduced by you, Mr. Chairman, by the Ranking Member, Ms. Johnson, by Ms. Woolsey among others.

The point I wish to stress is that every step of the way in this process there has been no divide at the center in this room. Republicans and Democrats have worked cooperatively to fashion this package.

Once again, I would urge my colleagues on the other side of the Capitol to take note of what we are doing here. I am delighted that we have been able to accomplish this in such a bipartisan fashion.

And I also want to make note of something else that is in the package. We reauthorized the Noyce Scholarship Program. That is something that Senator Rockefeller and I several years ago were able to get passed by the Congress and signed into law. It was great because we authorized money for stipends for the best and the brightest in math and science and engineering in our undergraduate programs to incentivise them to go into teaching in public education.

The problem is, and this often happens on the Hill, the authorization was there, and we all applauded. The appropriations never followed. We are going to be persevering as we go forward to try

to make certain we also get the money to match—the wallet to match the will, if you will.

So let me say to everyone in this room associated with this package, job well done, and let us continue. Thank you very much, Mr. Chairman.

Chairman SMITH. Thank you, Mr. Chairman, and without objection all members may place opening statements in the record.

We will now consider H.R. 1858 and—for the first reading of the bill, and I would ask unanimous consent that the bill be considered read and open to amendment at any time. Without objection it is so ordered. We will move to the first amendment on the bill and which the—is the Manager's Amendment offered by myself and Representative Johnson.

And I would ask unanimous consent that the amendment be considered en Bloc. Without objection it is so ordered.

The clerk will read the amendment.

Madam CLERK. Amendment to H.R. 1858.

Chairman SMITH. That is enough. I would ask for unanimous consent that the amendment be considered read. Thank you very much. Without objection it is ordered.

I recognize myself for five minutes to explain this bipartisan amendment.

This amendment has been worked out with the—both Republicans and Democrats, and Ms. Johnson has agreed to cosponsor it. I know members and staff have had an opportunity to review the amendment so I will just try to summarize some of the highlights briefly.

Title III has been expanded to include an Education Research Teacher Fellowship Program, a provision originally included in my education research legislation. This program similar to the Teacher Research Scholarship Program in Title I focuses on creating opportunities for elementary and secondary teachers to pursue research on learning in university laboratories and elsewhere with a goal of helping bridge the gap between the basic research and the classroom.

The amendment would authorize $5 million to NSF to carry out this section. The amendment also modifies the Robert Noyce Scholarship Provisions of the original bill by changing the penalty assessed on the scholarship recipients who don't complete the teaching service requirement.

In addition the amendment adds the Mathematics and Science Proficiency Partnerships Program originally introduced by our Ranking Member Ms. Johnson, a measure this Committee passed last year.

It also adds a provision authorizing articulation partnerships between community colleges and secondary schools, assessment of in-service teacher professional development programs, and educational technology research centers.

Again, this is a bipartisan amendment, and I am pleased to be joined by my Ranking Member in offering it. Now I would like to yield to Ms. Johnson for any comment she may have on the amendment.

Ms. JOHNSON. Thank you, Mr. Chairman. I am pleased to join you in offering this bipartisan amendment to H.R. 1858 and incor-

porates substantial portions of H.R. 1693, the Democratic Science Education Bill, introduced by Ranking Member Hall.

H.R. 1693, in turn, contains a range of provisions from the Democratic members that have appeared at separate bills and legislative proposals before the Committee during the last Congress.

I want to commend the collegial process through which this amendment was developed. I believe we all approach this matter with an appreciation of the importance of finding creative and effective ways to address the serious deficiencies that now exist in K through 12 science and math education.

The Manager's Amendment and underlying bill comprise of a range of proposals from several members on both sides of the aisle on ways to improve teacher training, to attract more talented students to careers as science and math teachers, and to develop more effective education materials and teaching practices to improve student learning.

It also authorizes new research programs to improve the scientific bases for teacher techniques and education materials, as well as to determine the effectiveness of new education approaches on student performance.

Mr. Chairman, I want to congratulate you and Chairman Boehlert for your hard work in developing this amendment and bringing the measure forward to a markup today. I want to acknowledge the efforts of Ranking Member Hall in developing 1693 and my colleagues on this side of the aisle who contributed provisions to this bill.

I am particularly pleased that the Manager's Amendment incorporates the Math and Science Proficiency Partnership Act, H.R. 1660, which I introduced this year and in the past two Congresses. My legislation is a targeted measure. It seeks to bring schools with large populations of economically-disadvantaged students together in partnership with businesses to improve math and science education and to recruit and support students in undergraduate education in science and technology fields.

The components of the partnership will include support from the National Science Foundation to the schools for teacher training, educational materials, and equipment. Industry will provide support for college scholarships for promising students, job site mentoring, and internship programs and donations of computer software and hardware. The overall effect of the partnerships would be to encourage support from promising students from undergraduate—underrepresented groups in pursuing careers in science and engineering. And I want to urge my colleagues to support the Manager's Amendment.

Thank you, Mr. Chairman.

Chairman SMITH. Thank you, Congresswoman Johnson, and our compliments to you also and all the members. Is there any additional discussion? If not, the vote——

Mr. HONDA. Mr. Chairman.

Chairman SMITH. Mr. Honda. Yes.

Mr. HONDA. Thank you. I would like to move to strike the last word and——

Chairman SMITH. Please proceed with your comments.

Mr. HONDA. Okay. Thank you. As a former science teacher, Mr. Chair, I am thrilled that this Subcommittee is marking up legisla-

tion that will improve the quality of science and math education in our schools.

I haven't been in our schools for many years as a teacher. I understand that America's teachers are in great need of technology training as well as new and challenging curriculum. And I have been working on two proposals that I believe address these needs in part.

First I would like to see more qualified college students in our schools assisting teachers to better integrate technology in our classroom curriculum.

And second, in the midst of this terrible energy crisis I think that we need to renew our effort to educate our children on energy conservation and renewable energies. We need to prepare them to be smart and critical energy consumers.

I am working with the Majority to develop these ideas into amendments to H.R. 1858, and I also appreciate the willingness of the Chair and the Majority to work with me on this effort. And I look forward to developing more concrete language that we all can agree to.

And let me just also recognize that I do believe that our Committees here is truly working in a bipartisan manner, and I sincerely appreciate that. Thank you, Mr. Chair.

Chairman SMITH. Thank you, Mr. Honda. Mr. Etheridge.

Mr. ETHERIDGE. Thank you, Mr. Chairman. I will be brief but let me thank you and the—all the folks who have worked on this because I think it is important. One of the pieces that I am very pleased to see in here because I think all of us understand that if we are going to improve math and science education, we have to do a much better job of in-service training because the challenge of getting new people in is always going to be a challenge. But the real critical piece to improve it and do it quickly certainly at the high school level is how well we do for the in-service for the people we already have there. And this partnership that is going to be able to be developed here between higher education and the public schools I think will add an awful lot to enhancing and enriching and moving that along much more rapidly.

And I thank you and commend the bill.

Chairman SMITH. We appreciate your comments. Your experience in education and as superintendent of schools for North Carolina is appreciated as we move ahead on the bill. Other discussion? If not, the vote occurs on the amendment. All in favor will signify by saying aye. Aye. Those opposed, no. In the opinion of the Chair the ayes have it, and the amendment is agreed to.

Are there any further amendments?

Ms. JOHNSON. Mr. Chairman.

Chairman SMITH. Hearing none the question is on the bill, H.R. 1858 as amended. Are you ready to vote? All those in favor will say aye. Aye. All those opposed say no. The ayes have it, and you might have to—Ms. Johnson, did you want to make a comment?

Ms. JOHNSON. I was just going to move that we——

Chairman SMITH. Oh, yes. The motion. Okay. Good.

Ms. JOHNSON. Mr. Chairman, I move that the Subcommittee favorably report the bill, H.R. 1858, as amended to the Full Committee with the recommendation that it be an order for the bill as amended by Subcommittee and incorporate it into an amendment

in the nature of a substitute for consideration as an original bill for the purpose of amendment under the five-minute rule at Full Committee.

Further, I ask unanimous consent that the staff be instructed to make all necessary technical and conforming changes to the bill as amended in accordance with the recommendations of the Subcommittee.

Chairman SMITH. The Committee has heard the motion. Those in favor will say aye. Aye. Those opposed no. The ayes have it, and the Chair notes the presence of a quorum. Now we will consider—oh, thank you, Peter. Without objection the motion to reconsider is laid on the table. The——

[H.R. 1858 follows:]

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107TH CONGRESS
1ST SESSION

# H. R. 1858

To make improvements in mathematics and science education, and for other purposes.

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IN THE HOUSE OF REPRESENTATIVES

MAY 16, 2001

Mr. BOEHLERT introduced the following bill; which was referred to the Committee on Science, and in addition to the Committee on Education and the Workforce, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

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# A BILL

To make improvements in mathematics and science education, and for other purposes.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

**SECTION 1. SHORT TITLE.**

This Act may be cited as the "National Mathematics and Science Partnerships Act".

**SEC. 2. FINDINGS.**

The Congress finds the following:

(1) 12 years ago the President of the United States convened the Nation's Governors to establish

common goals for the improvement of elementary and secondary education.

(2) Among the National Education Goals established was the goal that by the year 2000 United States students would be first in the world in mathematics and science achievement.

(3) Despite these goals, 8th graders in the United States showed just average performance in mathematics and science in the Third International Mathematics and Science Study-Repeat and demonstrated lower relative performance than the cohort of 4th graders 4 years earlier.

(4) The United States must redouble its efforts to provide all of its students with a world-class education in mathematics, science, engineering, and technology.

**SEC. 3. DEFINITIONS.**

In this Act—

(1) the term "Director" means the Director of the National Science Foundation;

(2) the term "institution of higher education" has the meaning given such term in section 101 of the Higher Education Act of 1965 (20 U.S.C. 1001);

(3) the term "eligible nonprofit organization" means a nonprofit research institute or a nonprofit professional association with demonstrated experience delivering mathematics or science education as determined by the Director;

(4) the term "local educational agency" has the meaning given such term in section 1401 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 8801); and

(5) the term "State educational agency" has the meaning given such term in section 1401 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 8801).

**SEC. 4. AUTHORIZATIONS OF APPROPRIATIONS.**

Any authorization of appropriations in this Act shall be considered to be in addition to amounts otherwise authorized or appropriated for the National Science Foundation.

# TITLE I—MATHEMATICS AND SCIENCE EDUCATION PARTNERSHIPS

## Subtitle A—Mathematics and Science Education Partnerships

**SEC. 101. PROGRAM AUTHORIZED.**

(a) IN GENERAL.—(1) The Director shall establish a program to award grants to institutions of higher education or eligible nonprofit organizations (or consortia thereof) to establish mathematics and science education partnership programs to improve the instruction of elementary and secondary science education.

(2) Grants shall be awarded under this section on a merit-reviewed competitive basis.

(b) PARTNERSHIPS.—(1) In order to be eligible to receive a grant under this section, an institution of higher education or eligible nonprofit organization (or consortium thereof) shall enter into a partnership with a local educational agency that may also include a State educational agency or one or more businesses, or both.

(2) A participating institution of higher education shall include mathematics, science, or engineering departments in the programs carried out through a partnership under this subsection.

(c) USES OF FUNDS.—Grants awarded under this section shall be used for activities that draw upon the expertise of the partners to improve elementary or secondary education, or both, in mathematics or science, or both. Such activities may include—

(1) recruiting and preparing students for careers in elementary or secondary mathematics or science education;

(2) offering professional development programs, including summer or academic year institutes or workshops, designed to strengthen the capabilities of existing mathematics and science teachers;

(3) offering innovative programs that instruct teachers on using technology more effectively in teaching mathematics and science;

(4) developing distance learning programs for teachers or students;

(5) offering teacher preparation and certification programs for professional mathematicians, scientists, and engineers who wish to begin a career in teaching;

(6) developing assessment tools to measure student mastery of content and cognitive skills;

(7) developing or adapting elementary and secondary school curricular materials, aligned to State

1 standards, that incorporate contemporary research
2 on the science of learning;
3 (8) developing undergraduate mathematics and
4 science courses for education majors;
5 (9) using mathematicians, scientists, and engi-
6 neers employed by private businesses to help recruit
7 and train mathematics and science teachers;
8 (10) developing a cadre of master teachers who
9 will promote reform and improvement in schools;
10 (11) developing and offering mathematics or
11 science enrichment programs for students;
12 (12) providing research opportunities in busi-
13 ness or academia for students and teachers;
14 (13) bringing mathematicians, scientists and
15 engineers from business and academia into elemen-
16 tary and secondary school classrooms; and
17 (14) any other activities the Director deter-
18 mines will accomplish the goals of this section.
19 (d) MATCHING FUNDS REQUIRED.—The Director
20 shall establish a minimum level of matching funds that
21 partnerships must provide to receive grants under this sec-
22 tion. The requirement shall specify the extent to which any
23 match may be provided in kind.

**SEC. 102. SELECTION PROCESS.**

(a) APPLICATION.—An institution of higher education or an eligible nonprofit organization (or a consortium thereof) seeking funding under section 101 shall submit an application to the Director at such time, in such manner, and containing such information as the Director may require. The application shall include, at a minimum—

(1) a description of the partnership and the role that each member will play in implementing the proposal;

(2) a description of each of the activities to be carried out, including—

(A) how such activities will be aligned with State and local standards and with other activities that promote student achievement in mathematics and science; and

(B) how such activities will be based on a review of relevant research, and why such activities are expected to improve student performance and strengthen the quality of mathematics and science instruction;

(3) how the partnership will serve as a catalyst for reform of mathematics and science education programs;

(4) how the partnership will assess its success;

(5) how the partnership will provide non-Federal matching funds; and

(6) policies and procedures to ensure that Federal funds will be used to supplement and not supplant funds being spent on improving science and mathematics education.

(b) REVIEW OF APPLICATIONS.—In evaluating the applications submitted under subsection (a), the Director shall consider—

(1) the ability of the partnership to effectively carry out the proposed programs;

(2) the extent to which the members of the partnership are committed to making the partnership a central organizational focus;

(3) the degree to which activities carried out by the partnership are based on relevant research and likely to result in increased student achievement;

(4) the degree to which such activities are aligned with State or local standards;

(5) the likelihood that the partnership will demonstrate activities that can be widely implemented as part of larger scale reform efforts; and

(6) the amount of non-Federal matching funds.

(c) AWARDS.—(1) The Director shall ensure, to the extent practicable, that partnership grants be awarded

1 under section 101 in a wide range of geographic areas and
2 that the partnership program include rural, suburban, and
3 urban local educational agencies.

4 (2) Not less than 50 percent of the partnerships
5 funded under section 101 shall include businesses.

6 (3) The Director shall award grants under this sub-
7 title for a period not to exceed 5 years.

8 **SEC. 103. ACCOUNTABILITY AND DISSEMINATION.**

9 (a) ASSESSMENT REQUIRED.—The Director shall
10 evaluate the partnerships program established under sec-
11 tion 101. At a minimum, such evaluations shall—

12 (1) use a common set of benchmarks and as-
13 sessment tools to identify best practices and mate-
14 rials developed and demonstrated by the partner-
15 ships; and

16 (2) to the extent practicable, compare the effec-
17 tiveness of practices and materials developed and
18 demonstrated by the partnerships authorized under
19 this subtitle with those of partnerships funded by
20 other State or Federal agencies.

21 (b) DISSEMINATION OF RESULTS.—(1) The results
22 of the evaluations required under subsection (a) shall be
23 made available to the public, including through the Na-
24 tional Science, Mathematics, Engineering, and Technology
25 Education Digital Library, and shall be provided to the

1 Committee on Science of the House of Representatives
2 and the Committee on Health, Education, Labor, and
3 Pensions and the Committee on Commerce, Science, and
4 Transportation of the Senate.

5 (2) Materials developed under the program estab-
6 lished under section 101 that are demonstrated to be ef-
7 fective shall be made available through the National
8 Science, Mathematics, Engineering, and Technology Edu-
9 cation Digital Library.

10 (c) ANNUAL MEETING.—The Director shall convene
11 an annual meeting of the partnerships participating under
12 this subtitle to foster greater national collaboration.

13 **SEC. 104. AUTHORIZATION OF APPROPRIATIONS.**

14 There are authorized to be appropriated to the Na-
15 tional Science Foundation to carry out this subtitle
16 $200,000,000 for each of fiscal years 2002 through 2006.

## 17 Subtitle B—Teacher Research
## 18 Scholarship Program

19 **SEC. 111. PROGRAM AUTHORIZED.**

20 (a) IN GENERAL.—(1) The Director shall establish
21 a program to award grants to institutions of higher edu-
22 cation or eligible nonprofit organizations (or consortia
23 thereof) to provide research opportunities in mathematics,
24 science, and engineering for elementary or secondary
25 school teachers of mathematics or science. Such institu-

1 tions of higher education or eligible nonprofit organiza-
2 tions may include one or more businesses or Federal or
3 State laboratories as partners under the program.
4 (2) Grants shall be awarded under this section on a
5 merit-reviewed competitive basis.
6 (b) PROGRAM COMPONENTS.—Grant recipients
7 under this section—
8 (1) shall recruit and select teachers and provide
9 such teachers with opportunities to conduct research
10 in academic, business, or government laboratories;
11 (2) shall ensure that the teachers have mentors
12 and other programming support to ensure that their
13 research experience will contribute to their under-
14 standing of mathematics, science, and engineering
15 and improve their performance in the classroom;
16 (3) shall provide teachers with a scholarship sti-
17 pend; and
18 (4) may provide room and board for residential
19 programs.
20 (c) USE OF FUNDS.—(1) Not more than 25 percent
21 of the funds provided under a grant under this section
22 may be used for programming support for teachers.
23 (2) The Director shall issue guidelines specifying the
24 minimum or maximum amounts of stipends recipients may
25 provide to teachers under this section.

(d) DURATION.—A teacher may participate in research under the program under this section for up to 1 calendar year or 2 sequential summers.

(e) MATCHING FUNDS REQUIRED.—The Director shall establish a minimum level of matching funds that grantees must provide to receive grants under this section. The requirement shall specify the extent to which any match may be provided in kind.

**SEC. 112. SELECTION PROCESS.**

(a) APPLICATION.—An institution of higher education or an eligible nonprofit organization (or a consortium thereof) seeking funding under section 111 shall submit an application to the Director at such time, in such manner, and containing such information as the Director may require. The application shall include, at a minimum—

(1) a description of the research opportunities that will be made available to elementary or secondary school teachers, or both, by the applicant;

(2) a description of how the applicant will recruit teachers to participate in the program and the criteria that will be used to select the participants;

(3) a description of the number, types, and amounts of the scholarships that the applicant intends to offer to participating teachers;

(4) a description of the programming support that will be provided to participating teachers;

(5) a description of how the applicant will provide non-Federal matching funds; and

(6) policies and procedures to ensure that Federal funds will be used to supplement and not supplant funds for improving science and mathematics education.

(b) REVIEW OF APPLICATIONS.—In evaluating the applications submitted under subsection (a), the Director shall consider—

(1) the ability of the applicant to effectively carry out the proposed program;

(2) the extent to which the applicant is committed to making the program a central organizational focus;

(3) the likelihood that the research experiences and programming to be offered by the applicant will improve elementary and secondary education; and

(4) the amount of non-Federal matching funds.

(c) AWARDS.—(1) The Director shall ensure, to the extent practicable, that grants be awarded under this subtitle in a wide range of geographic areas and to assist teachers from rural, suburban, and urban local educational agencies.

(2) The Director shall award grants under this subtitle for a period not to exceed 5 years.

**SEC. 113. AUTHORIZATION OF APPROPRIATIONS.**

There are authorized to be appropriated for the National Science Foundation to carry out this subtitle $15,000,000 for each of fiscal years 2002 through 2006.

# TITLE II—NATIONAL SCIENCE, MATHEMATICS, ENGINEERING, AND TECHNOLOGY EDUCATION DIGITAL LIBRARY

**SEC. 201. IN GENERAL.**

The Director shall establish a program to expand the National Science, Mathematics, Engineering, and Technology Education Digital Library (hereinafter in this Act referred to as the "Digital Library") program to enable timely and continuous dissemination of elementary and secondary science, math, engineering, and technology educational resources, materials, practices, and policies through the Internet and other digital technologies. The expanded Digital Library shall—

(1) contain an Internet-based repository of curricular materials, practices, and teaching modules;

(2) provide users of the Digital Library with access to all materials in the Digital Library through a single entry point;

(3) contain only materials that have been peer-reviewed and tested to ensure factual accuracy and effectiveness and that are aligned with recognized State and national mathematics and science standards;

(4) present materials in a format that is consistent, facilitates ease of comparison and use by classroom teachers, and contains appropriate links to other Federal educational clearinghouses; and

(5) provide materials related to mathematics and science partnership programs, including—

(A) links to all of the programs developed through the mathematics and science partnerships established under subtitle A of title I;

(B) data related to assessment and evaluation and final program reports developed under subtitle A of title I, including both positive and negative outcomes of the program;

(C) materials developed by the partnerships under subtitle A of title I that have been demonstrated to be effective; and

(D) a mechanism for users to make comments or suggestions regarding the use and effectiveness of posted materials.

**SEC. 202. GRANTS AND CONTRACT.**

(a) DESIGN OF LIBRARY.—(1) The Director may award grants to institutions of higher education or other qualified entities to design all or parts of the Digital Library. The grants may cover the costs of acquiring and reviewing educational materials for dissemination through the Digital Library.

(2) Grants shall be awarded under this subsection on a merit-reviewed competitive basis.

(b) OPERATION.—The Director may contract out the operation and management of the Digital Library.

**SEC. 203. AUTHORIZATION OF APPROPRIATIONS.**

There are authorized to be appropriated for the National Science Foundation to carry out this title $20,000,000 for each of fiscal years 2002 through 2006.

# TITLE III—STRATEGIC EDUCATION RESEARCH PROGRAM

**SEC. 301. ESTABLISHMENT OF CENTERS FOR RESEARCH ON LEARNING AND EDUCATION IMPROVEMENT.**

(a) IN GENERAL.—(1) The Director shall award grants to institutions of higher education (or consortia thereof) to establish 4 multidisciplinary Centers for Research on Learning and Education Improvement.

(2) Grants shall be awarded under this subsection on a merit-reviewed competitive basis.

1 (b) PURPOSE.—The purpose of the Centers shall be
2 to conduct and evaluate research in cognitive science, edu-
3 cation and related fields and to develop ways in which the
4 results of such research can be applied in elementary and
5 secondary classrooms to improve the teaching of mathe-
6 matics and science.

7 (c) FOCUS.—(1) Each Center shall be focused on a
8 different challenge faced by elementary or secondary
9 school teachers of mathematics and science. In deter-
10 mining the research focus of the Centers, the Director
11 shall consult with the National Academy of Sciences and
12 take into account the extent to which other Federal pro-
13 grams support research on similar questions.

14 (2) The proposal solicitation issued by the Director
15 shall state the focus of each Center and applicants shall
16 apply for designation as a specific Center.

17 (d) MATCHING FUNDS REQUIRED.—The Director
18 shall establish a minimum level of matching funds that
19 grantees must provide to receive grants under this section.
20 The requirement shall specify the extent to which any
21 match may be provided in kind.

22 **SEC. 302. SELECTION PROCESS.**

23 (a) APPLICATION.—An institution of higher edu-
24 cation (or a consortium thereof) seeking funding under
25 this title shall submit an application to the Director at

1 such time, in such manner, and containing such informa-
2 tion as the Director may require. The application shall in-
3 clude, at a minimum a description of—
4 (1) the initial research projects that will be un-
5 dertaken by the Center and the process by which
6 new projects will be identified;
7 (2) how the Center will work with other re-
8 search institutions and schools to broaden the na-
9 tional research agenda on learning and teaching;
10 (3) how the Center will promote active collabo-
11 ration among physical, biological, and social science
12 researchers;
13 (4) how the Center will promote active partici-
14 pation by elementary and secondary mathematics
15 and science teachers and administrators;
16 (5) how the Center will reduce the results of its
17 research to educational practice and assess the suc-
18 cess of new practices;
19 (6) how non-Federal matching funds will be
20 provided; and
21 (7) policies and procedures to ensure that Fed-
22 eral funds will be used to supplement and not sup-
23 plant funds that would otherwise be made available
24 for purposes of this title.

(b) REVIEW OF APPLICATIONS.—In evaluating the applications submitted under subsection (a), the Director shall consider—

(1) the ability of the applicant to effectively carry out the research program and reduce its results to effective educational practice;

(2) the experience of the applicant in conducting research on the science of teaching and learning and the capacity of the applicant to foster new multidisciplinary collaborations;

(3) the capacity of the applicant to attract precollege educators from a diverse array of schools and professional experiences for participation in Center activities; and

(4) the amount of non-Federal matching funds.

**SEC. 303. ANNUAL CONFERENCE.**

The Director shall convene an annual meeting of the Centers to foster collaboration among the Centers and to further disseminate the results of the Centers' activities.

**SEC. 304. AUTHORIZATION OF APPROPRIATIONS.**

There are authorized to be appropriated for the National Science Foundation to carry out this title $12,000,000 for each of fiscal years 2002 through 2006.

# TITLE IV—ROBERT NOYCE SCHOLARSHIP PROGRAM

**SEC. 401. DEFINITIONS.**

In this title—

(1) the term "mathematics and science teacher" means a mathematics, science, or technology teacher at the elementary or secondary school level;

(2) the term "mathematics, science, or engineering professional" means a person who holds a baccalaureate, masters, or doctoral degree in science, mathematics, or engineering and is working in that field or a related area;

(3) the term "scholarship" means an award under section 405; and

(4) the term "scholarship recipient" means a student receiving a scholarship;

(5) the term "stipend" means an award under section 406;

(6) the term "stipend recipient" means a science, mathematics or engineering professional receiving a stipend; and

(7) the term "cost of attendance" has the meaning given such term in section 472 of the Higher Education Act of 1965 (20 U.S.C. 1087ll).

1 **SEC. 402. SCHOLARSHIP PROGRAM.**

2 (a) IN GENERAL.—(1) The Director shall establish
3 a program to award grants to institutions of higher edu-
4 cation (or consortia thereof) to provide scholarships and
5 programming designed to recruit and train mathematics
6 and science teachers. Such program shall be known as the
7 "Robert Noyce Scholarship Program".

8 (2) Grants shall be provided under this section on a
9 merit-reviewed competitive basis.

10 (b) USE OF GRANTS.—Grants provided under this
11 title shall be used by institutions of higher education—

12 (1) to develop and implement a program to en-
13 courage top college juniors and seniors majoring in
14 mathematics, science, and engineering at the grant-
15 ee's institution to become mathematics and science
16 teachers, through—

17 (A) administering scholarships in accord-
18 ance with section 405;

19 (B) offering programs to help scholarship
20 recipients to teach in elementary and secondary
21 schools, including programs that will result in
22 teacher certification; and

23 (C) offering programs to scholarship re-
24 cipients, both before and after they receive their
25 baccalaureate degree, to enable the recipients to
26 become better mathematics and science teach-

ers, and to exchange ideas with others in their fields; or

(2) to develop and implement a program to encourage science, mathematics, or engineering professionals to become mathematics and science teachers, through—

(A) administering stipends in accordance with section 406;

(B) offering programs to help stipend recipients obtain teacher certification; and

(C) offering programs to stipend recipients, both during and after matriculation, to enable recipients to become better mathematics and science teachers and exchange ideas with others in their fields; or

(3) for both of the purposes described in paragraphs (1) and (2).

(c) MATCHING FUNDS REQUIRED.—The Director shall establish a minimum level of matching funds that grantees must provide to receive grants under this section. The requirement shall specify the extent to which any match may be provided in kind. Grant recipients shall not be required to contribute toward the cost of scholarships.

1 **SEC. 403. SELECTION PROCESS.**

2 (a) APPLICATION.—An institution of higher edu-
3 cation (or a consortium thereof) seeking funding under
4 this title shall submit an application to the Director at
5 such time, in such manner, and containing such informa-
6 tion as the Director may require. The application shall in-
7 clude, at a minimum—

8 (1) a description of the scholarship or stipend
9 program, or both, that the applicant intends to oper-
10 ate, including the number of scholarships or the size
11 and number of stipends the applicant intends to
12 award, and the selection process that will be used in
13 awarding the scholarships or stipends;

14 (2) evidence that the applicant has the capa-
15 bility to administer the scholarship or stipend pro-
16 gram in accordance with the provisions of this title;

17 (3) a description of the programming that will
18 be offered to scholarship or stipend recipients during
19 and after their matriculation;

20 (4) a description of how the non-Federal match-
21 ing funds will be provided; and

22 (5) a description of policies and procedures to
23 ensure that Federal funds will be used to supple-
24 ment and not supplant funds that would otherwise
25 be made available for purposes of this title.

1 (b) REVIEW OF APPLICATIONS.—In evaluating the
2 applications submitted under subsection (a), the Director
3 shall consider—
4 (1) the ability of the applicant to effectively
5 carry out the program;
6 (2) the extent to which the applicant is com-
7 mitted to making the program a central organiza-
8 tional focus;
9 (3) the ability of the proposed programming to
10 enable scholarship or stipend recipients to become
11 successful mathematics and science teachers;
12 (4) the number and quality of the students that
13 will be served by the program;
14 (5) the ability of the applicant to recruit stu-
15 dents who would otherwise not pursue a career in
16 teaching; and
17 (6) the amount of non-Federal matching funds.
18 **SEC. 404. AWARDS.**
19 (a) DESIGNATION.—The Director shall designate in-
20 stitutions awarded grants under this title as "National
21 Teacher Scholarship Centers".
22 (b) DISTRIBUTION.—The Director shall ensure, to
23 the extent practicable, that grants be awarded under this
24 title in a wide range of geographic areas and to prepare

1 students for jobs in rural, suburban, and urban local edu-
2 cational agencies.
3 (c) DURATION.—Grants awarded under this title
4 shall be for a period of 10 years.

5 **SEC. 405. SCHOLARSHIP REQUIREMENTS.**

6 (a) IN GENERAL.—Scholarships under this title shall
7 be available only to students who are—
8 (1) majoring in science, mathematics, or engi-
9 neering; and
10 (2) in the last 2 years of a baccalaureate degree
11 program.
12 (b) SELECTION.—Individuals shall be selected to re-
13 ceive scholarships primarily on the basis of academic
14 merit, with consideration given to financial need and to
15 the goal of promoting the participation of minorities,
16 women, and people with disabilities.
17 (c) AMOUNT.—Scholarships under this title shall be
18 in the amount of $7,500 per year, or the cost of attend-
19 ance, whichever is less. Individuals may receive a max-
20 imum of 2 years of scholarship support.
21 (d) SERVICE OBLIGATION.—If an individual receives
22 a scholarship, that individual shall be required to com-
23 plete, within 6 years after graduation from the bacca-
24 laureate degree program for which the award was made,
25 2 years of service as a mathematics or science teacher for

each year an award was received. Service required under this subsection shall be performed at a school receiving assistance under chapter 1 of title I of the Elementary and Secondary Education Act of 1965 (Public Law 89–10).

**SEC. 406. STIPENDS.**

(a) IN GENERAL.—Stipends under this title shall be available only to mathematics, science, and engineering professionals who, while receiving the stipend, are enrolled in a program to receive certification to teach.

(b) SELECTION.—Individuals shall be selected to receive stipends under this title primarily on the basis of academic merit, with consideration given to financial need and to the goal of promoting the participation of minorities, women, and people with disabilities.

(c) AMOUNT.—Stipends under this title shall be for an amount of up to $7,500 per year, but in no event more than the cost of tuition. Individuals may receive a maximum of 1 year of stipend support.

(d) SERVICE OBLIGATION.—If an individual receives a stipend under this title, that individual shall be required to complete, within 6 years after graduation from the program for which the award was made, 2 years of service as a mathematics or science teacher for each award received. Service required under this subsection shall be per-

1 formed at a school receiving assistance under chapter 1
2 of title I of the Elementary and Secondary Education Act
3 of 1965 (Public Law 89–10).

4 **SEC. 407. CONDITIONS OF SUPPORT.**

5 As a condition of acceptance of a scholarship or sti-
6 pend under this title, a recipient shall enter into an agree-
7 ment with the institution of higher education—

8 (1) accepting the terms of the scholarship or
9 stipend pursuant to section 405 or 406 and section
10 409;

11 (2) agreeing to provide the awarding institution
12 of higher education with annual certification of em-
13 ployment and current contact information and to
14 participate in surveys provided by the institution of
15 higher education as part of an ongoing assessment
16 program; and

17 (3) establishing that the scholarship or stipend
18 recipient shall be liable to the United States for any
19 amount that is required to be repaid in accordance
20 with the provisions of section 409.

21 **SEC. 408. COLLECTION FOR NONCOMPLIANCE.**

22 (a) MONITORING COMPLIANCE.—An institution of
23 higher education (or consortium thereof) receiving a grant
24 under this title shall, as a condition of participating in
25 the program, enter into an agreement with the Director

1 to monitor the compliance of scholarship and stipend re-
2 cipients with their respective service requirements.

3 (b) COLLECTION OF REPAYMENT.—(1) In the event
4 that a scholarship or stipend recipient is required to repay
5 the scholarship or stipend under section 409, the institu-
6 tion shall be responsible for collecting the repayment
7 amounts.

8 (2) Except as provided in paragraph (3), any repay-
9 ment shall be returned to the Treasury of the United
10 States.

11 (3) A grantee may retain a percentage of any repay-
12 ment it collects to defray administrative costs associated
13 with the collection. The Director shall establish a single,
14 fixed percentage that will apply to all grantees.

15 **SEC. 409. FAILURE TO COMPLETE SERVICE OBLIGATION.**

16 (a) GENERAL RULE.—If an individual who has re-
17 ceived an award under this title—

18 (1) fails to maintain an acceptable level of aca-
19 demic standing in the educational institution in
20 which the individual is enrolled, as determined by
21 the National Science Foundation;

22 (2) is dismissed from such educational institu-
23 tion for disciplinary reasons;

(3) withdraws from the baccalaureate degree program for which the award was made before the completion of such program;

(4) declares that the individual does not intend to fulfill his service obligation under this title; or

(5) fails to fulfill the service obligation of the individual under this title,

such individual shall be liable to the United States as provided in subsection (b).

(b) AMOUNT OF REPAYMENT.—(1) If a circumstance described in subsection (a)(1), (2), (3), or (4) occurs before the completion of one year of a service obligation under this title, the United States shall be entitled to recover from the individual, within one year after the date of the occurrence of such circumstance, an amount equal to—

(A) the total amount of awards received by such individual under this title; plus

(B) the interest on such amounts which would be payable if at the time the amounts were received they were loans bearing interest at the maximum legal prevailing rate, as determined by the Treasurer of the United States,

multiplied by 3.

1 (2) If a circumstance described in subsection (a)(1),
2 (2), (3), or (4) occurs after the completion of one year
3 of a service obligation under this title, but before the com-
4 pletion of the second year of such service obligation, the
5 United States shall be entitled to recover from the indi-
6 vidual, within one year after the date of the occurrence
7 of such circumstance, an amount equal to—
8 (A) the total amount of awards received by
9 such individual under this title minus $3,750; plus
10 (B) the interest on such amounts which would
11 be payable if at the time the amounts were received
12 they were loans bearing interest at the maximum
13 legal prevailing rate, as determined by the Treasurer
14 of the United States,
15 multiplied by 3.
16 (3) If a circumstance described in subsection (a)(1),
17 (2), (3), or (4) occurs after the completion of two years
18 of a service obligation under this title, but before the com-
19 pletion of the third year of such service obligation, the
20 United States shall be entitled to recover from the indi-
21 vidual, within one year after the date of the occurrence
22 of such circumstance, an amount equal to—
23 (A) the total amount of awards received by
24 such individual under this title minus $7,500; plus

1 (B) the interest on such amounts which would
2 be payable if at the time the amounts were received
3 they were loans bearing interest at the maximum
4 legal prevailing rate, as determined by the Treasurer
5 of the United States,
6 multiplied by 3.
7 (4) If a circumstance described in subsection (a)(1),
8 (2), (3), or (4) occurs after the completion of three years
9 of a service obligation under this title, but before the com-
10 pletion of the fourth year of such service obligation, the
11 United States shall be entitled to recover from the indi-
12 vidual, within one year after the date of the occurrence
13 of such circumstance, an amount equal to—
14 (A) the total amount of awards received by
15 such individual under this title minus $11,250; plus
16 (B) the interest on such amounts which would
17 be payable if at the time the amounts were received
18 they were loans bearing interest at the maximum
19 legal prevailing rate, as determined by the Treasurer
20 of the United States,
21 multiplied by 3.
22 (c) EXCEPTIONS.—(1) The National Science Founda-
23 tion may provide for the partial or total waiver or suspen-
24 sion of any service obligation or payment by an individual
25 under this title whenever compliance by the individual is

1 impossible or would involve extreme hardship to the indi-
2 vidual, or if enforcement of such obligation with respect
3 to the individual would be unconscionable.

4 (2) Any obligation of an individual under this title
5 for payment under subsection (b) may be released by a
6 discharge in bankruptcy under title 11, United States
7 Code, only if such discharge is granted after the expiration
8 of the 5-year period beginning on the first date that such
9 payment is required.

10 **SEC. 410. AUTHORIZATION OF APPROPRIATIONS.**

11 (a) IN GENERAL.—There are authorized to be appro-
12 priated to the National Science Foundation to carry out
13 this title $20,000,000 for each of fiscal years 2002
14 through 2005.

15 (b) SPECIFIC APPROPRIATIONS.—There are author-
16 ized to be appropriated to the National Science Founda-
17 tion to support the activities described in subsections
18 (b)(1)(A) and (C) and (b)(2)(A) and (C) of section 402,
19 such sums as may be necessary for each of fiscal years
20 2006 through 2011.

# TITLE V—SCIENCE, MATHEMATICS, ENGINEERING, AND TECHNOLOGY BUSINESS EDUCATION CONFERENCE

**SEC. 501. REQUIREMENT TO CONVENE CONFERENCE.**

(a) IN GENERAL.—Not later than 1 year after the date of the enactment of this Act, the Director of the Office of Science and Technology Policy shall convene a conference on improving kindergarten through 12th grade science, mathematics, and technology education.

(b) PARTICIPANTS.—The Director of the Office of Science and Technology Policy shall ensure that participants in the conference include, at a minimum—

(1) representatives of private industry;

(2) representatives from Federal, State, and local governments;

(3) elementary and secondary mathematics, science, and technology teachers;

(4) administrators from local educational agencies;

(5) publishers of science, mathematics, engineering, and technology textbooks and software;

(6) professional scientists, mathematicians, and engineers;

(7) students; and

1 (8) any other stakeholders the Director of the
2 Office of Science and Technology Policy determines
3 would provide useful participation in the conference.
4 (c) PURPOSES.—The purposes of the conference shall
5 be to—
6 (1) share information on successful science,
7 mathematics, engineering, and technology education
8 programs; and
9 (2) identify strategies for expanding the partici-
10 pation of the private sector in elementary and sec-
11 ondary mathematics and science education reform.
12 (d) REPORT AND PUBLICATION.—At the conclusion
13 of the conference the Director of the Office of Science and
14 Technology Policy shall—
15 (1) transmit to the Committee on Science of the
16 House of Representatives and to the Committee on
17 Commerce, Science, and Transportation of the Sen-
18 ate a report on the outcome and conclusions of the
19 conference, including recommendations for any legis-
20 lation that could promote improvement in elemen-
21 tary and secondary science, mathematics, and tech-
22 nology education; and
23 (2) ensure that a similar report is published
24 and distributed as widely as possible to people inter-

ested in science, mathematics, engineering, and technology education.

(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated for the Office of Science and Technology Policy to carry out this title $300,000 for fiscal year 2002.

# TITLE VI—REQUIREMENTS FOR RESEARCH CENTERS

**SEC. 601. REQUIREMENTS FOR RESEARCH CENTERS.**

The Director shall ensure that any National Science Foundation program that awards grants for the establishment of research centers at institutions of higher education after the date of the enactment of this Act—

(1) requires that every center offer programs for elementary and secondary mathematics and science teachers and students to increase their understanding of the field in which the center specializes; and

(2) uses the quality of a center's proposed precollege education programs as a criterion in determining grant awards.

○

**COMMITTEE ON SCIENCE**

**SUBCOMMITTEE ON RESEARCH**

**Thursday, June 7, 2001**

**AMENDMENT ROSTER**

**H.R. 1858,** National Mathematics and Science Partnerships Act

| No. | Sponsor | Description | Results |
|---|---|---|---|
| 1 | Mr. Smith and Ms. Johnson | Manager's Amendment: en Bloc to H.R. 1858 | |
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## AMENDMENT TO H.R. 1858
## OFFERED BY MR. SMITH OF MICHIGAN AND
## MS. EDDIE BERNICE JOHNSON OF TEXAS

Page 3, after line 18, insert the following:

1 **SEC. 5. MATCHING REQUIREMENTS.**

2 The Director may establish matching fund require-
3 ments for any programs authorized by this Act except
4 those established in title IV.

Page 4, lines 18 and 19, strike "a local educational agency and insert "one or more local educational agencies .

Page 5, line 17, after "students insert ", including developing courses, curricular materials and other resources for the in-service professional development of teachers that are made available to teachers through the Internet .

Page 6, line 11, after "students insert ", including after-school and summer programs .

Page 6, strike lines 19 through 23, and insert the following:

5 (d) SCIENCE ENRICHMENT PROGRAMS FOR GIRLS.
6 Activities carried out in accordance with subsections
7 (c)(11) and (12) shall include elementary and secondary

1 school programs to encourage the ongoing interest of girls
2 in science, mathematics, engineering and technology and
3 to prepare girls to pursue undergraduate and graduate de-
4 grees and careers in science, mathematics, engineering or
5 technology. Funds made available through awards to part-
6 nerships for the purposes of this subsection may support
7 programs for

8 (1) encouraging girls to pursue studies in
9 science, mathematics, engineering and technology
10 and to major in such fields in postsecondary edu-
11 cation;

12 (2) tutoring girls in science, mathematics, engi-
13 neering and technology;

14 (3) providing mentors for girls in person and
15 through the Internet to support such girls in pur-
16 suing studies in science, mathematics, engineering
17 and technology;

18 (4) educating the parents of girls about the dif-
19 ficulties faced by girls to maintain an interest and
20 desire to achieve in science, mathematics, engineer-
21 ing and technology, and enlisting the help of parents
22 in overcoming these difficulties; and

23 (5) acquainting girls with careers in science,
24 mathematics, engineering and technology and en-
25 couraging girls to plan for careers in such fields.

Page 7, line 19, insert "how such activities will encourage the interest of women and minorities in science, mathematics, engineering and technology and will help prepare women and minorities to pursue postsecondary studies in these fields, after "relevant research .

Page 7, line 25, insert "and after the semicolon.

Page 7, line 26, strike the semicolon and insert a period.

Page 8, strike lines 1 through 6.

Page 8, line 19, insert "and after the semicolon.

Page 8, line 22, strike "; and and insert a period.

Page 8, strike line 23.

Page 11, line 24, strike "or and insert "and .

Page 12, strike lines 4 through 8.

Page 12, line 25, insert "and after the semicolon.

Page 13, line 2, strike the semicolon and insert a period.

Page 13, strike lines 3 through 8.

Page 13, line 16, insert "and after the semicolon.

Page 13, line 19, strike "; and and insert a period.

Page 13, strike line 20.

Page 16, strike lines 2 through 7, and insert the following:

1 (a) GRANTS. The Director may award grants to in-
2 stitutions of higher education or other qualified entities
3 (1) to design all or parts of the Digital Library;
4 (2) to provide assistance to schools in the selec-
5 tion and adaptation of curricular materials, practices
6 and teaching methods made available through the
7 Digital Library; or
8 (3) to carry out the activities described in both
9 paragraphs (1) and (2).
10 Grants awarded under this subsection may cover the costs
11 of acquiring and reviewing educational materials for dis-
12 semination through the Digital Library.

Page 16, strike lines 8 and 9.

Page 16, after line 11, insert the following:

13 (c) COMPETITIVE AWARDS. Grants and contracts
14 shall be awarded under this section on a competitive basis.

Page 16, after line 17, insert the following:

15 **"Subtitle A Centers .**

16 Page 17, strike lines 17 through 21.

Page 18, line 15, insert "and after the semicolon.

Page 18, line 18, strike the semicolon and insert a period.

Page 18, strike lines 19 through 24.

Page 19, strike line 15, and insert the following:

1 (5) the capacity of the applicant to attract and
2 provide adequate support for graduate students to
3 pursue research at the intersection of educational
4 practice and basic research on human cognition and
5 learning.

Page 19, after line 23, insert the following:

6 **Subtitle B Fellowships**

7 **SEC. 311. EDUCATION RESEARCH TEACHER FELLOWSHIPS.**

8 (a) ESTABLISHMENT. (1) The Director shall estab-
9 lish a program to award grants to institutions of higher
10 education or eligible nonprofit entities (or consortia there-
11 of) to provide research opportunities related to the science
12 of learning to elementary and secondary school teachers
13 of science and mathematics.

14 (2) Grants shall be awarded under this section on a
15 merit-reviewed competitive basis.

16 (b) PROGRAM COMPONENTS. Grant recipients
17 under this section

(1) shall recruit and select teachers and provide such teachers with opportunities to conduct research in the fields of

(A) brain research as a foundation for research on human learning;

(B) behavioral, cognitive, affective, and social aspects of human learning;

(C) science and mathematics learning in formal and informal educational settings; or

(D) learning in complex educational systems;

(2) shall ensure that participating teachers have mentors and other programming support to ensure that their research experience will contribute to their understanding of the science of learning;

(3) shall provide programming, guidance, and support to ensure that participating teachers disseminate information about the current state of education research and its implications on classroom practice to other elementary and secondary educators and can use that information to improve their performance in the classroom;

(4) shall provide participating teachers with a scholarship stipend; and

1 (5) may provide room and board for residential
2 programs.
3 (c) USE OF FUNDS. (1) Not more than 25 percent
4 of the funds provided under a grant under this section
5 may be used for programming support for participating
6 teachers.
7 (2) The Director shall issue guidelines specifying the
8 minimum or maximum amounts of stipends grant recipi-
9 ents may provide to teachers under this section.
10 (d) DURATION. A teacher may participate in re-
11 search under the program under this section for up to 1
12 calendar year or 2 sequential summers.
13 (e) APPLICATION. An institution of higher edu-
14 cation or eligible nonprofit entity (or a consortium thereof)
15 seeking funding under this section shall submit an applica-
16 tion to the Director at such time, in such manner, and
17 containing such information as the Director may require.
18 The application shall include, at a minimum
19 (1) a description of the research opportunities
20 that will be made available to elementary or sec-
21 ondary school teachers, or both, by the applicant;
22 (2) a description of how the applicant will re-
23 cruit teachers to participate in the program, and the
24 criteria that will be used to select the participants;

1 (3) a description of the number, types, and
2 amounts of the scholarships that the applicant in-
3 tends to offer to participating teachers; and
4 (4) a description of the programming support
5 that will be provided to participating teachers to en-
6 hance their research experience and to enable them
7 to educate their peers about the value, findings, and
8 implications of education research.
9 (f) REVIEW OF APPLICANTS. In evaluating the ap-
10 plications submitted under subsection (e), the Director
11 shall consider
12 (1) the ability of the applicant to effectively
13 carry out the proposed program;
14 (2) the extent to which the applicant is com-
15 mitted to making the program a central organiza-
16 tional focus; and
17 (3) the likelihood that the research experiences
18 and programming to be offered by the applicant will
19 improve elementary and secondary education.
20 (g) AUTHORIZATION OF APPROPRIATIONS. There
21 are authorized to be appropriated to the National Science
22 Foundation for carrying out this section $5,000,000 for
23 each of fiscal years 2002 through 2004.

Page 22, strike lines 18 through 23.

Page 23, line 16, insert "and after the semicolon.

Page 23, line 19, strike the semicolon and insert a period.

Page 23, strike lines 20 through 25.

Page 24, line 13, insert "and after the semicolon.

Page 24, line 16, strike "; and and insert a period.

Page 24, strike line 17.

Page 25, line 24, strike "award was made and insert "scholarship was awarded .

Page 26, line 1, strike "award and insert "scholarship .

Page 26, line 18, strike "tuition and insert "attendance .

Page 26, line 23, strike "award was made and insert "stipend was awarded .

Page 26, line 24, strike "award and insert "year a stipend was .

Page 27, lines 9 and 10, strike "section 405 or 406 and section 409 and insert "sections 405 and 409 or section 406 .

Page 27, line 17, strike "the scholarship or stipend and insert "any scholarship .

Page 28, line 4, strike "or stipend .

Page 28, line 5, strike "or stipend .

Page 28, line 17, strike "an award and insert "a scholarship .

Page 29, line 11, strike "(1), (2), (3) or (4) .

Page 29, line 24, strike "3 and insert "2 .

Page 30, strike line (1) and all that follows through page 31, line 21, and insert the following:

1 (2) If a circumstance described in subsection (a)(4)
2 or (a)(5) occurs after the completion of one year of a serv-
3 ice obligation under this title, the United States shall be
4 entitled to recover from the individual, within one year
5 after the date of the occurrence of such circumstance, an
6 amount equal to
7 (A) the total amount of awards received by
8 such individual under this title minus $3,750 for
9 each full year of service completed; plus
10 (B) the interest on such amounts which would
11 be payable if at the time the amounts were received
12 they were loans bearing interest at the maximum
13 legal prevailing rate, as determined by the Treasurer
14 of the United States.

Page 33, strike line 1 and all that follows through page 35, line 6.

Page 35, line 7, strike "**VI** and insert "**V** .

Page 35, line 9, strike "**601** and insert "**501** .

Page 35, after line 21, insert the following new titles:

# TITLE VI MISCELLANEOUS PROVISIONS

**SEC. 601. MATHEMATICS AND SCIENCE PROFICIENCY PARTNERSHIPS.**

(a) FINDINGS. Congress finds the following:

(1) Proficiency in mathematics, science, and information technology is necessary to prepare all students in the United States for participation in the 21st Century and to guarantee that the United States economy remains vibrant and competitive.

(2) In order to achieve such results, it is important that the Federal Government shows interest in economically disadvantaged students who have not been provided with opportunities that will improve their knowledge of mathematics, science, and technology.

(3) Many economically disadvantaged students in urban and rural America share a common need

1 to receive a quality education, but often the schools
2 of such students lack the needed resources to lift
3 those students into the information age.
4 (4) The schools and businesses serving urban
5 and rural communities are strategically positioned to
6 form a unique partnership with students that will in-
7 crease their mathematics, science, and technology
8 proficiency and encourage and support their under-
9 graduate study in those fields for the benefit of the
10 Nation.
11 (b) AUTHORITY. (1)(A) The Director shall establish
12 a demonstration project under which the Director awards
13 grants in accordance with this section to eligible local edu-
14 cational agencies.
15 (B) A local educational agency that receives a grant
16 under this section may use such grant funds to develop
17 a program that builds or expands mathematics, science,
18 and information technology curricula, to purchase equip-
19 ment necessary to establish such program, and to provide
20 professional development to enhance teacher quality in
21 those fields.
22 (2) A program described in paragraph (1) shall
23 (A) provide teacher professional development
24 specifically in information technology, mathematics,
25 and science; and

1 (B) provide students with a rich standards-
2 based course of study in mathematics, science, and
3 information technology.
4 (c) ELIGIBLE LOCAL EDUCATIONAL AGENCIES.
5 For purposes of this section, a local educational agency
6 is eligible to receive a grant under this section if the
7 agency
8 (1) provides assurances that it has executed
9 conditional agreements with representatives of the
10 private sector to provide services and funds de-
11 scribed in subsection (d); and
12 (2) agrees to enter into an agreement with the
13 Director to comply with the requirements of this sec-
14 tion.
15 (d) PRIVATE SECTOR PARTICIPATION. The condi-
16 tional agreements referred to in subsection (c)(1) shall de-
17 scribe participation by the private sector, including
18 (1) the donation of computer hardware, soft-
19 ware, and other technology tools;
20 (2) the establishment of internship and men-
21 toring opportunities for students who participate in
22 the mathematics, science, and information tech-
23 nology program; and

1 (3) the donation of higher education scholarship
2 funds for eligible students to continue their study of
3 mathematics, science, and information technology.
4 (e) APPLICATION. (1) To apply for a grant under
5 this section, each eligible local educational agency shall
6 submit an application to the Director in accordance with
7 guidelines established by the Director pursuant to para-
8 graph (2).
9 (2)(A) The guidelines referred to in paragraph (1)
10 shall require, at a minimum, that the application
11 include
12 (i) a description of proposed activities con-
13 sistent with the uses of funds and program require-
14 ments under paragraphs (1)(B) and (2) of sub-
15 section (b);
16 (ii) a description of the higher education schol-
17 arship program, including criteria for selection, du-
18 ration of scholarship, number of scholarships to be
19 awarded each year, and funding levels for scholar-
20 ships; and
21 (iii) evidence of private sector participation and
22 financial support to establish an internship, men-
23 toring, and scholarship program.

1 (B) The Director shall issue and publish such guide-
2 lines not later than 6 months after the date of the enact-
3 ment of this Act.
4 (3) The Director shall select a local educational agen-
5 cy to receive an award under this section on the basis of
6 merit to be determined after conducting a comprehensive
7 review.
8 (f) PRIORITY. The Director shall give special pri-
9 ority in awarding grants under this section to eligible local
10 educational agencies that
11 (1) demonstrate the greatest ability to obtain
12 commitments from representatives of the private sec-
13 tor to provide services and funds described under
14 subsection (d); and
15 (2) demonstrate the greatest economic need.
16 (g) ASSESSMENT. The Director shall assess the ef-
17 fectiveness of activities carried out under this section.
18 (h) STUDY AND REPORT. The Director
19 (1) shall initiate an evaluative study of the ef-
20 fectiveness of the activities carried out under this
21 section in improving student performance in mathe-
22 matics, science, and information technology at the
23 precollege level and in stimulating student interest
24 in pursuing undergraduate studies in those fields;
25 and

1 (2) shall report the findings of the study to
2 Congress not later than 4 years after the award of
3 the first scholarship.
4 Such report shall include the number of students grad-
5 uating from an institution of higher education with a
6 major in mathematics, science, or information technology
7 and the number of students who find employment in such
8 fields.
9 (i) DEFINITIONS. In this section:
10 (1) The term "conditional agreement means
11 an arrangement between representatives of the pri-
12 vate sector and local educational agencies to provide
13 certain services and funds, such as, but not limited
14 to, the donation of computer hardware and software,
15 the establishment of internship and mentoring op-
16 portunities for students who participate in mathe-
17 matics, science, and information technology pro-
18 grams, and the donation of scholarship funds for use
19 at institutions of higher education by eligible stu-
20 dents who have participated in the mathematics,
21 science, and information technology programs.
22 (2) The term "eligible student means a stu-
23 dent enrolled in the 12th grade who

1 (A) has participated in a mathematics,
2 science, and an information technology program
3 established pursuant to this section;
4 (B) has demonstrated a commitment to
5 pursue a career in information technology,
6 mathematics, science, or engineering; and
7 (C) has attained high academic standing
8 and maintains a grade point average of not less
9 than 2.7 on a 4.0 scale for the period from the
10 beginning of the 10th grade through the time
11 of application for a scholarship.
12 (j) AUTHORIZATION OF APPROPRIATIONS. There
13 are authorized to be appropriated to the National Science
14 Foundation to carry out this section $5,000,000 for each
15 of fiscal years 2002 through 2004.
16 (k) MAXIMUM GRANT AWARD. An award made to
17 an eligible local educational agency under this section may
18 not exceed $300,000.
19 **SEC. 602. ARTICULATION PARTNERSHIPS BETWEEN COM-**
20 **MUNITY COLLEGES AND SECONDARY**
21 **SCHOOLS.**
22 (a) OUTREACH GRANTS. In making awards for out-
23 reach grants authorized under section 3(c)(2) of the Sci-
24 entific and Advanced-Technology Act of 1992 (42 U.S.C.
25 1862i(c)(2)), the Director shall give priority to proposals

1 that involve secondary schools with a majority of students
2 from groups that are underrepresented in the science,
3 mathematics and engineering workforce. Awards in such
4 cases shall not be subject to the requirement under section
5 3(f)(3) of such Act for a matching contribution.

6 (b) AUTHORIZATION OF APPROPRIATIONS. There
7 are authorized to be appropriated to the National Science
8 Foundation to carry out this section $5,000,000 for each
9 of fiscal years 2002 through 2004.

10 **SEC. 603. ASSESSMENT OF IN-SERVICE TEACHER PROFES-**
11 **SIONAL DEVELOPMENT PROGRAMS.**

12 (a) ASSESSMENT. The Director shall review all pro-
13 grams sponsored by the National Science Foundation that
14 support in-service teacher professional development for
15 science teachers to determine

16 (1) the level of resources and degree of empha-
17 sis placed on training teachers in the effective use of
18 information technology in the classroom; and

19 (2) the allocation of resources between summer
20 activities and follow-on reinforcement training and
21 support to participating teachers during the school
22 year.

23 (b) REPORT. The Director shall submit to Congress,
24 not later than 1 year after the date of the enactment of
25 this Act, a report that

1 (1) describes the results of the review and as-
2 sessment conducted under subsection (a);
3 (2) summarizes the major categories of in-serv-
4 ice teacher professional development activities sup-
5 ported at the time of the review, and the funding
6 levels for such activities; and
7 (3) describes any proposed changes, including
8 new funding allocations, to strengthen the in-service
9 teacher professional development programs of the
10 National Science Foundation that support activities
11 described in paragraphs (a)(1) and (2).

# 12 TITLE VII EDUCATIONAL 13 TECHNOLOGIES

## 14 SEC. 701. EDUCATIONAL TECHNOLOGY RESEARCH CEN- 15 TERS.

16 (a) IN GENERAL. (1) The director shall establish a
17 program to award grants to institutions of higher edu-
18 cation (or consortia thereof) to establish centers to evalu-
19 ate and improve the effectiveness of information tech-
20 nologies in elementary and secondary mathematics and
21 science education.
22 (2) Grants shall be awarded under this title on a
23 merit-reviewed competitive basis.
24 (b) ACTIVITIES. Centers established under this title
25 shall, at a minimum

1 (1) identify educational approaches and tech-
2 niques that are based on the use of information
3 technology and that have the potential for being ef-
4 fective in classroom settings;
5 (2) develop methods to measure the effective-
6 ness of various applications of information tech-
7 nology in mathematics and science education, includ-
8 ing methods to measure student performance;
9 (3) evaluate the effectiveness of the use of tech-
10 nology in elementary and secondary mathematics
11 and science education in a variety of classroom set-
12 tings; and
13 (4) identify the key variables that influence
14 educational effectiveness and the conditions nec-
15 essary to implement successfully an approach or
16 technique determined to be educationally effective
17 for a particular educational setting;
18 (5) ensure that the results of such evaluations
19 are widely disseminated; and
20 (6) develop a program to work with local edu-
21 cational agencies to help them apply the results of
22 the research conducted under this section.
23 **SEC. 702. SELECTION PROCESS.**
24 (a) APPLICATION. An institution of higher edu-
25 cation (or a consortium thereof) seeking funding under

1 this title shall submit an application to the Director at
2 such time, in such manner, and containing such informa-
3 tion as the Director may require. The application shall in-
4 clude, at a minimum, a description of
5 (1) the approaches to the use of information
6 technology that the center will initially evaluate, how
7 it chose those approaches, how it will seek out any
8 additional approaches, and how assessment proce-
9 dures would be developed and applied;
10 (2) how the center will work with local edu-
11 cation agencies to evaluate the approaches in class-
12 rooms;
13 (3) how the center will disseminate the results
14 of its work; and
15 (4) how the center will develop an outreach pro-
16 gram to work with local educational agencies to help
17 them apply the results of its research.
18 (b) REVIEW OF APPLICATIONS. In evaluating the
19 applications submitted under subsection (a), the Director
20 shall consider the ability of the applicant to effectively
21 evaluate information technology approaches and to help
22 local education agencies apply the results of those evalua-
23 tions.

1 (c) AWARDS. The Director shall ensure, to the ex-
2 tent practicable, that the program established under this
3 title evaluates information technology
4 (1) in a wide range of grade levels and geo-
5 graphic areas;
6 (2) in rural, suburban, and urban schools; and
7 (3) with a wide variety of students in terms of
8 race, ethnicity, and affluence.

9 **SEC. 703. DOCUMENTATION AND DISSEMINATION OF RE-**
10 **SULTS.**

11 (a) IN GENERAL. The results of the research and
12 evaluations conducted in accordance with section 701 shall
13 be documented and widely disseminated, including
14 through publication in peer-reviewed scholarly journals.
15 (b) WORKSHOPS, CONFERENCE, AND WEB SITES.
16 The Director is authorized to sponsor and support work-
17 shops, conferences, and dedicated web sites to disseminate
18 information about the activities of the educational tech-
19 nology research centers established under section 701.
20 (c) DEPOSIT IN LIBRARY. Information about effec-
21 tive approaches and techniques, including information and
22 materials necessary for their implementation, shall be de-
23 posited in the Digital Library.

1 **SEC. 704. AUTHORIZATION OF APPROPRIATIONS.**

2 There are authorized to be appropriated to the Na-
3 tional Science Foundation to carry out the program estab-
4 lished under section 701

5 (1) $25,000,000 for each of fiscal years 2002
6 through 2004; and

7 (2) $30,000,000 for each of fiscal years 2005
8 and 2006.

**Summary**

## Amendment to H.R. 1858

**to be offered**
**by Congressman Nick Smith and Congresswoman Eddie Bernice Johnson**

**Sec. 5. Matching Requirements.**
Adds a new section that allows the Director of NSF to establish matching fund requirements for any of the programs authorized by the bill, with the exception of the Noyce Scholarship program described in Title IV. Strikes the requirement for matching funds in each program and all other references to matching funds in the bill. Also removes the requirement that Federal funds be used to supplement and not supplant funds awarded under programs authorized by the bill.

**Title I (Math and Science Partnership program)**

**Section 101(d). Science Enrichment Programs for Girls.**
Adds a new section that specifies that the allowable activities for partnerships shall include programs to encourage the ongoing interest of girls in science, mathematics, engineering and technology and prepare them to pursue college and graduate-level study in these fields. Allows funds awarded under the partnership program to be used for activities such as tutoring, mentoring, and parental support.

**Section 102(2)(b). Selection Process.**
Phrase added that requires applications for Partnership grants to describe how the proposed activities will encourage the interest of women and minorities in science, math, engineering, and technology and will help to prepare women and minorities to pursue further education in those fields.

**Title II (Digital Library program)**

**Section 202. Grants and contract.**
Adds a provision that enables institutions of higher education to use grant funds to provide assistance to schools for the selection and adaptation of curricular materials, practices, and teaching methods that are made available through the Digital Library.

**Title III (Strategic Education Research program)**

**Section 302(b). Review of applications.**
Adds a provision that requires the Director to consider the capacity of an institution of higher education applying for a Education Research Center grant to attract and provide adequate support for graduate students to pursue research at the intersection of educational practice and basic research on human cognition and learning.

**Subtitle B—Fellowships**
**Section 305. Education research teacher fellowships.**
Adds a new Subtitle that sets up a fellowship program for K-12 teachers to pursue education research fellowships at institutions of higher education. Grants will be awarded on a competitive, peer-reviewed basis to institutions of higher education to set up programs that will enable K-12 teachers to conduct research on cognitive science or education research under the guidance of a researcher at the institution. $5,000,000 authorized for each of fiscal years 2002 through 2004.

**Title IV (Robert Noyce Scholarship Program)**

**Section 409(b). Amount of repayment.**
Changes amount that scholarship recipients who do not perform their full service obligation (by teaching in a K-12 school for two years for every year of scholarship money received) must repay. Scholarship recipients who do not complete even a single year of their service obligation would be required to pay back the amount of the award (plus interest) multiplied by two.

Scholarship recipients who complete at least one year of their service obligation but do not complete the rest must repay only the total amount of their award, less $3750 for each year of service completed, plus interest.

**Title V (Science, Mathematics, Engineering, and Technology Business Education Conference)**

Strikes this title, which is included in very similar form in H.R. 100.

**Title VI (Miscellaneous provisions)**

Adds a new Title with the following sections:

**Section 601. Mathematics and Science Proficiency Partnerships.**
Establishes an NSF program to award grants of less than $300,000 (on a peer-reviewed, competitive basis) to local educational agencies to use to develop math, science, and information technology curricula, purchase equipment necessary to establish such programs, and provide professional development opportunities for teachers. In order to qualify for such a grant, the local educational agency must execute an agreement with a private sector entity to provide services and funds that include: donations of computers, establishment of internship and mentoring programs, and the provision of college scholarships for students committed to pursuing a career in math, science or information technology. Special priority will be given to grant applicants that demonstrate the greatest economic need and the greatest ability to attract funds and services from the private sector. $5,000,000 authorized for each year 2002 through 2004.

**Section 602. Articulation partnerships between community colleges and secondary schools.**
For grant awards authorized under section 3(c)(2) of the Scientific and Advanced-Technology Act of 1992, requires the Director to give priority to grant proposals that involve secondary schools with a majority of students from groups that are underrepresented in the science, mathematics, and engineering workforce. $5,000,000 authorized for each of fiscal years 2002 through 2004.

**Section 603. Assessment of in-service teacher professional development programs.**
Requires the Director to review all NSF programs that support teacher training programs to determine 1) what level of resources and degree of emphasis is placed on the training of teachers in the effective use of information technologies and 2) the allocation of resources between summer activities and follow-on training and support to participating teachers during the school year. Requires that a report be made to Congress on the results of the review.

**Title VII (Education Technologies)**

Adds a new Title with the following sections:

**Section 701. Educational technology research centers.**
Establishes an NSF program to award grants (on a peer-reviewed, competitive basis) to institutions of higher education to establish centers to evaluate and improve the effectiveness of information technologies in K-12 math and science education. Centers would be required to identify and study the effectiveness of educational approaches and techniques that are based on the use of information technology, to identify the key variables affecting educational effectiveness, and then to ensure that the results of this analysis are widely disseminated and effectively applied by K-12 schools.

**Section 702. Selection process.**
Grant applicants are required to describe their research approach, how assessments would be developed and applied, how the center will work with K-12 schools, how their work will be disseminated, and how they will develop an outreach program to work with local schools in order to apply the results of their research.

**Section 703. Documentation and dissemination of results.**
Requires the results of the Centers' research to be documented and widely disseminated, and allows the Director to sponsor conferences, workshops, and websites in order to disseminate information further.

**Section 704. Authorization of appropriations.**
$25,000,000 for each of fiscal years 2002 through 2004; $30,000,000 for each of fiscal years 2005 and 2006.

**COMMITTEE ON SCIENCE**
**U.S. House of Representatives**
**Washington, D.C. 20515**

**Section by Section of H.R. 1858**

*H.R. 1858 -To make improvements in mathematics and science education, and for other purposes.*

**SECTION 1. SHORT TITLE.**
'National Mathematics and Science Partnerships Act'

**SECTION 2. FINDINGS.**
(1) 12 years ago the President called upon the Nation's Governors to establish common goals for the improvement of K-12 education.
(2) One of the goals was that by the year 2000, U.S. students would be first in the world in math and science achievement.
(3) Despite the goals, U.S. 8th graders have only demonstrated average performance in math and science achievement.
(4) The U.S. must redouble its efforts in math, science, engineering, and technology education.

**SECTION 3. DEFINITIONS.**
(1) Director- Director of NSF
(2) Institution of higher education - § 101 of Higher Education Act of 1965 (20 U.S.C. 1001)
(3) Eligible nonprofit organization – nonprofit research institute or nonprofit professional association with a demonstrated experience delivering science and math education as determined by the Director
(4) Local educational agency - § 1401 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 8801)
(5) State educational agency - § 1401 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 8801)

**SECTION 4. AUTHORIZATION OF APPROPRIATIONS.**
Authorization of appropriations shall be considered to be in addition to amounts otherwise authorized or appropriated for the National Science Foundation.

**TITLE I--MATHEMATICS AND SCIENCE EDUCATION PARTNERSHIPS.**
**Subtitle A--Mathematics and Science Education Partnerships**

**SECTION 101. PROGRAM AUTHORIZED.**
(a) IN GENERAL – The Director shall establish a program to award grants (selected on a merit-reviewed competitive basis) to institutions of higher education or eligible nonprofit organizations to establish math and science partnership programs.

(b) PARTNERSHIPS – Those eligible for grants shall enter into partnerships with local educational agencies and may enter into partnerships with state educational agencies or

business or both. A higher education institution shall include mathematics, science or engineering departments in the programs carried out through a partnership.

(c) USE OF FUNDS - Grants awarded under this section shall be used for activities that draw upon the expertise of the partners to improve elementary or secondary education, or both, in mathematics or science, or both.

(d) MATCHING FUNDS REQUIRED - The Director shall establish a minimum level of matching funds that partnerships must provide to receive grants under this section. The requirement shall specify the extent to which any match may be provided in kind.

**SECTION 102. SELECTION PROCESS.**

(a) APPLICATION - Those entities seeking grants under §101 shall submit an application to the Director in a manner determined by the Director and containing such information as required by the Director. At a minimum, the application shall contain a description of the partnership and the role of each partner, a description of the activities to be carried out, how the partnership will improve math and science education programs, how it will measure success, how the partnership will provide non-Federal matching funds, and the policies and procedures to ensure the Federal funds will be supplementing (not supplanting) funds being spent on math and science education.

(b) REVIEW OF APPLICATION – When evaluating the applications, the Director shall consider the ability of the partnership to be effective, the extent to which the partnership members are committed to make the partnership a priority, whether the activities are based on relevant research and are likely to produce results, whether the activity is aligned with state and local standards, the likelihood the results will be able to be implemented on a larger scale, and the amount of non-Federal matching funds.

(c) AWARDS – Grants under this program shall be geographically diverse. No less than 50% of the grants shall include businesses. Grants are not to exceed 5 years.

**SECTION. 103. ACCOUNTABILITY AND DISSEMINATION.**

(a) ASSESSMENT REQUIRED – The Director shall assess the partnerships by using a common set of benchmarks and assessment tools to identify the best practices and materials developed by the partnerships, and compare the effectiveness of this program with similar State and Federal partnerships.

(b) DISSEMINATION OF RESULTS – The results of the assessment shall be made available to the public and the relevant House and Senate Committees.

(c) ANNUAL MEETING – the Director shall convene an annual meeting of the partnerships to foster greater national collaboration.

**SECTION. 104. AUTHORIZATION OF APPROPRIATIONS.**

FY2002 – FY2006 - $200M each fiscal year

**Subtitle B—Teacher Research Scholarship Program**

**SECTION 111. PROGRAM AUTHORIZED.**

(a) IN GENERAL - The Director shall establish a program to award grants (selected on a merit-reviewed competitive basis) to institutions of higher education or eligible nonprofit organizations to provide research opportunities in mathematics, science, and engineering for elementary or secondary school teachers of mathematics or science. Businesses or State laboratories may be included as partners in the program.
(b) PROGRAM COMPONENTS – Grant recipients shall recruit and select teachers and give them opportunities to conduct research. Teachers will be provided with mentors to ensure the research is improving their understanding of math and science and will translate into results in the classroom. A stipend will be provided and room and board may be provided.
(c) USE OF FUNDS – Not more than 25% of the funds shall be used for programming support for teachers. The Director shall specify minimum or maximum stipend amounts.
(d) DURATION – A teacher may participate in this program for up to 1 calendar year or 2 sequential summers.
(e) MATCHING FUNDS REQUIRED – The Director shall establish a minimum level of matching funds.

**SECTION 112. SELECTION PROCESS.**
(a) APPLICATION - Those entities seeking grants under §111 shall submit an application to the Director in a manner determined by the Director and containing such information required by the Director. At a minimum, the application shall contain a description of the research opportunities available to teachers, a description of the recruitment and selection process, the number, type, and amounts of the scholarships, a description of the programming support, description of non-Federal matching funds, and the policies and procedures to ensure the Federal funds will be supplementing (not supplanting) funds being spent on math and science education.
(b) REVIEW OF APPLICATION – When evaluating the applications, the Director shall consider the ability of the partnership to be effective, the extent to which the partnership members are committed to make the partnership a priority, the likelihood the results will improve classroom instruction, and the amount of non-Federal matching funds.
(c) AWARDS - Grants under this program shall be geographically diverse. Grants are not to exceed 5 years.

**SECTION 113. AUTHORIZATION OF APPROPRIATIONS.**
FY2002 – FY2006 - $15M each fiscal year

**TITLE II--NATIONAL SCIENCE, MATHEMATICS, ENGINEERING, AND TECHNOLOGY EDUCATION DIGITAL LIBRARY.**

**SECTION 201. IN GENERAL.**
The Director shall establish a program to expand the National Science, Mathematics, Engineering, and Technology Education Digital Library program to enable timely and continuous dissemination of elementary and secondary science, math, engineering, and technology educational resources, materials, practices, and policies through the Internet and other digital technologies.

**SECTION 202. GRANTS AND CONTRACT.**

The Director may award grants (which are on a merit- reviewed competitive basis) to institutions of higher learning or other qualified entities to design all or part of the Digital Library. The Director may contract out operation of the Digital Library.

**SECTION 203. AUTHORIZATION OF APPROPRIATIONS.**
FY2002 – FY2006 – $20M each fiscal year

**TITLE III--STRATEGIC EDUCATION RESEARCH PROGRAM.**

**SECTION 301. ESTABLISHMENT OF CENTERS FOR RESEARCH ON LEARNING AND EDUCATION IMPROVEMENT.**

(a) IN GENERAL - The Director shall award grants (which are on a merit- reviewed competitive basis) to institutions of higher education to establish 4 multidisciplinary Centers for research on Learning and Education Improvement.
(b) PURPOSE - conduct and evaluate research in cognitive science, education and related fields and to develop ways in which the results of such research can be applied in the teaching of mathematics and science.
(c) FOCUS - Each Center shall have a distinct focus. In determining the research focus of the Centers, the Director shall consult with the National Academy of Sciences and take into account the extent to which other Federal programs support research on similar questions.
(d) MATCHING FUNDS REQUIRED – The Director shall establish a minimum level of matching funds.

**SECTION 302. SELECTION PROCESS.**

(a) APPLICATION - Those entities seeking funds under this title shall submit an application to the Director in a manner determined by the Director and containing such information required by the Director. At a minimum, the application shall contain a description of the initial projects to be undertaken, how the center will interact with other institutions, how the Center will promote collaboration among researchers, how the Center will promote teacher participation, how the Center will apply its research and assess results, a description of non-Federal matching funds, and the policies and procedures to ensure the Federal funds will be supplementing (not supplanting) funds being spent on math and science education.
(b) REVIEW OF APPLICATION – When evaluating the applications, the Director shall consider the ability of the applicant to be effective, the experience of the applicant, the ability of the applicant to attract educators from a diverse array of experiences, and the amount of non-Federal matching funds.

**SECTION 303. ANNUAL CONFERENCE.**
The Director shall convene an annual meeting of the Centers to foster collaboration among the Centers.

**SECTION 304. AUTHORIZATION OF APPROPRIATIONS.**
FY 2002 – FY 2006 - $12M each fiscal year

**TITLE IV--ROBERT NOYCE SCHOLARSHIP PROGRAM.**

**SECTION 401. DEFINITIONS.**

(1) Mathematics and science teacher – K-12 math, science, or technology teacher.
(2) Mathematics, science, or engineering professional - person who holds a baccalaureate, masters, or doctoral degree in science, mathematics, or engineering and is working in that field or a related area.
(3) Scholarship – under § 405 of this title.
(4) Scholarship recipient – student receiving scholarship
(5) Stipend – under § 406 of this title.
(6) Stipend recipient - science, mathematics or engineering professional receiving a stipend.
(7) Cost of attendance -term in section 472 of the Higher Education Act of 1965 (20 U.S.C. 1087ll).

**SECTION 402. SCHOLARSHIP PROGRAM.**
(a) The Director shall establish a grants program (which are on a merit- reviewed competitive basis) to higher education institutions to award scholarships to recruit and train science and math teachers – 'Robert Noyce Scholarship Program.'
(b) Grants under this title shall be used to develop a program to encourage top college juniors and seniors majoring in science and math and science, math, and engineering professionals to become science and math teachers by administering scholarships and stipends, offering programs to help recipients get certified to teach in elementary and secondary education, and offering programs (during and after college) to help recipients to become better mathematics and science teachers.
(c) MATCHING FUNDS REQUIRED – The Director shall establish a minimum level of matching funds.

**SECTION 403. SELECTION PROCESS.**
(a) APPLICATION - Those entities seeking funds under this title shall submit an application to the Director in a manner determined by the Director and containing such information required by the Director. At a minimum, the application shall contain a description of the program, evidence the applicant can administer such a program, a description of the programming that will be offered, description of non-Federal matching funds, and the policies and procedures to ensure the Federal funds will be supplementing (not supplanting) funds being spent on math and science education.
(b) REVIEW OF APPLICATION - When evaluating the applications, the Director shall consider the ability of the entity to be effective, the applicant's willingness to make the program a priority, whether the programming will enable recipients to become successful science and math teachers, the number of students served, the ability to recruit students, the amount of non-Federal matching funds.

**SECTION 404. AWARDS.**
The Director shall designate institutions receiving grants under this program as 'National Teacher Scholarship Centers.' Grants awards will be geographically diverse. Grants will be for a period of 10 years.

**SECTION 405. SCHOLARSHIP REQUIREMENTS.**
(a) IN GENERAL – Scholarships are available only to students in their final 2 years of college majoring in math, science, or engineering.

(b) SELECTION – primarily on the basis of merit and with a consideration of financial need and promoting the participation of women, minorities, and the disabled.
(c) AMOUNT - $7,500/year – maximum 2 years
(d) SERVICE OBLIGATION – requires recipient to serve as a science or math teacher in a school receiving public assistance for 2 years for each year of an award within the first 6 years after graduation.

**SECTION 406. STIPENDS.**
(a) IN GENERAL – Stipends available to math, science, or engineering professionals enrolled in a teaching certification program.
(b) SELECTION – primarily on the basis of merit and with a consideration of financial need and promoting the participation of women, minorities, and the disabled.
(c) AMOUNT - $7,500/year – maximum 2 years
(d) SERVICE OBLIGATION – requires recipient to serve as a science or math teacher in a school receiving public assistance for 2 years for each year of an award within the first 6 years after graduation.

**SECTION 407. CONDITIONS OF SUPPORT.**
As a condition of acceptance of a scholarship or stipend, a recipient shall enter into an agreement with the institution of higher education that accepts the terms of §§ 405 or 406, and § 409, agreeing to provide the institution with annual certification of employment and contact information. Establishes that the recipient is liable to the US should they not fulfill the obligations.

**SECTION 408. COLLECTION FOR NONCOMPLIANCE.**
An institution of higher education receiving grants shall enter into an agreement with the Director to monitor recipients' compliance with the service requirements. The institution is required to collect from the recipient should default occur and return the repayment to the Treasury of the US. Institutions may retain a percentage (set by the Director) to defray administrative costs.

**SECTION 409. FAILURE TO COMPLETE SERVICE OBLIGATION.**
(a) GENERAL RULE - If an individual fails to complete the program, demonstrates poor academic standing, or refuses to fulfill the service obligation that person shall be liable to the US.
(b) AMOUNT OF REPAYMENT –
  (1) Before 1 year of service – (amount of award + interest as if award was loan) x 3
  (2) After 1 year, but before 2 - (amount of award - $3750 + interest as if award was loan) x 3
  (3) After 2, but before 3 - (amount of award - $7500 + interest as if award was loan) x 3
  (4) After 3, but before 4 - (amount of award - $11,250 + interest as if award was loan) x 3
(c) EXCEPTIONS – the NSF may grant an exception to the repayment if it would result in hardship, is impossible, or unconscionable.

**SECTION 410. AUTHORIZATION OF APPROPRIATIONS.**
(a) IN GENERAL- FY 2002 – 2005 - $20M each fiscal year.

(b) SPECIFIC APPROPRIATIONS -- §§ 402(b)(1)(A) and (C); 402(b)(2)(A) and (C) FY 2006 – 2011 - such sums as may be necessary.

**TITLE V – SCIENCE, MATHEMATICS, ENGINEERING, AND TECHNOLOGY BUSINESS EDUCATION CONFERENCE.**

**SECTION. 501. REQUIREMENT TO CONVENE CONFERENCE.**
Requires the Director of OSTP to convene a conference on improving K-12 science and math education within 1 year of the enactment of this Act. Participants shall include representatives from private industry, Federal, state, and local governments, teachers, school administrators, math and science publishers and software developers, professional scientists and mathematicians, students, and any other stakeholder the Director of OSTP determines useful. $300,000 authorized for FY 2002.

**TITLE VI – REQUIREMENTS FOR RESEARCH CENTERS.**

**SECTION 601. REQUIREMENTS FOR RESEARCH CENTERS.**
The Partnerships Act requires the Director of NSF to ensure that any NSF grants that establish new research centers at institutions of higher education incorporate an elementary and secondary mathematics, science, engineering or technology education component as part of their program.

XXII. PROCEEDINGS OF FULL COMMITTEE MARKUP

# H.R. 1858, NATIONAL MATHEMATICS AND SCIENCE PARTNERSHIPS ACT

**JUNE 13, 2001**

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE,
*Washington, DC.*

The Committee met, pursuant to call, at 10:05 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Sherwood L. Boehlert (chairman of the committee) presiding.

Chairman BOEHLERT. Meeting will come to order. The first order of business is to welcome back Mr. Gilchrest to the Committee. By order of the Republican caucus of the House Committee on Science, Mr. Gilchrest will fill the vacancy on the Environment, Technology, and Standards Subcommittee. Without objection, so ordered. The Committee on Science will be in order. Pursuant to notice, the Committee on Science is meeting today to consider the following measures. H.R. 1858, National Mathematics and Science Partnerships Act, and H.R. 100, National Science Education Act. I ask unanimous consent for the authority to recess the Committee at any point and without objection, so ordered. I ask unanimous consent for the substitutes to H.R. 1858 and H.R. 100, as adopted by the Subcommittee on Research on June 7, 2001, be considered as original text for the purpose of the Markup at Full Committee today.

COMMITTEE ON SCIENCE
*Washington, DC, June 7, 2001.*

MEMORANDUM

To: Sherwood L. Boehlert, Chairman.
From: Nick Smith, Chairman, Subcommittee on Research.
Re Subcommittee Mark-up of H.R. 1858.

On June 7, 2001, the Subcommittee on Research held a mark-up of H.R. 1858, National Mathematics and Science Partnerships Act. A Manager's Amendment was offered by Mr. Smith and Ms. Johnson and was adopted by a voice vote.

Attached for your information is a section by section analysis and a copy of the measure.

## H.R. 1858, AS REPORTED BY THE SUBCOMMITTEE ON RESEARCH ON June 7, 2001

### SEC. 1. SHORT TITLE.

"National Mathematics and Science Partnerships Act"

### SEC. 2. FINDINGS.

Discuss the goal set by the Nation's Governors to establish the U.S. as the world's leaders in math and science achievement by the year 2000, the failure to reach that goal, and the need to redouble efforts to provide all of the country's students with a world-class education in math, science, engineering, and technology.

### SEC. 3. DEFINITIONS.

Provides the standard references to define "institution of higher education", "local educational agency", "state educational agency", "Director", and defines "eligible nonprofit organization".

### SEC. 4. AUTHORIZATIONS OF APPROPRIATIONS.

Any authorization of appropriations in the bill is in addition to amounts otherwise authorized or appropriated for the National Science Foundation (NSF).

### SEC. 5. MATCHING REQUIREMENTS.

Allows the Director of NSF to establish matching fund requirements for any of the programs authorized by the bill, with the exception of the Noyce Scholarship program described in Title IV.

### TITLE I. MATHEMATICS AND SCIENCE EDUCATION PARTNERSHIPS.

### SUBTITLE A. MATHEMATICS AND SCIENCE EDUCATION PARTNERSHIPS.

Establishes a competitive, merit-based program to award grants to institutions of higher education or eligible nonprofit organizations to establish math and science partnership programs. Requires institutions of higher education to partner with one or more local educational agencies to be eligible to receive a partnership grant. Partnerships may also include a state educational agency and/or one or more businesses. Requires that the higher education institution include a mathematics, science or engineering department in the programs carried out through the partnership. At least 50% of the partnerships must include businesses.

Lists allowable activities for partnership programs that include teacher recruitment, training, and professional development—including training in educational technologies—distance learning programs, development of curricular materials and assessment tools, and others, including any other activities the NSF Director determines will accomplish the goals of the program. Specifies that the allowable activities for partnerships shall include programs to encourage the ongoing interest of girls in science, mathematics, engineering and technology and prepare them to pursue college and graduate-level study in these fields.

Requires NSF Director to ensure, to the extent practicable, that partnership grants be awarded in a geographically diverse fashion, and that the partnerships include a diverse array of rural, urban and suburban school districts.

Authorization of $200 million for each of fiscal years 2002 through 2006.

**SUBTITLE B. TEACHER RESEARCH SCHOLARSHIP PROGRAM**

Establishes a competitive, merit-based grant program for institutions of higher education or eligible nonprofit organizations to provide research opportunities in mathematics, science, and engineering for math and science teachers. Businesses or State laboratories may be included as partners in the program. Grant recipients recruit and select teachers, give them opportunities to conduct research, and provide them with mentors and programming support. Grant recipients must provide a stipend to participating teachers and may provide room and board. Requires NSF Director to ensure, to the extent practicable, that partnership grants be awarded in a geographically diverse fashion, including rural, urban and suburban areas.

Authorization of $15 million for each of fiscal years 2002 through 2006.

**TITLE II. NATIONAL SCIENCE, MATHEMATICS, ENGINEERING, AND TECNOLOGY EDUCATION DIGITAL LIBRARY.**

Directs the NSF Director to expand the National Science, Mathematics, Engineering, and Technology Education Digital Library program by providing grants, on a competitive, peer-reviewed basis, to institutions of higher education or other qualified entities to provide timely and continuous dissemination of K-12 science, math, engineering, and technology educational resources, materials, practices, and policies through the Internet and other digital technologies. Allows grant recipients to use funds to provide assistance to schools for the selection and adaptation of curricular materials, practices, and teaching methods that are made available through the Digital Library. Allows the Director to contract out operation of the Digital Library.

Authorization of $20 million for each of fiscal years 2002 through 2006.

**TITLE III. STRATEGIC EDUCATION RESEARCH PROGRAM.**

**SUBTITLE A. CENTERS.**

Directs the NSF Director to establish four multidisciplinary Centers for Research on Learning and Education Improvement by awarding grants, using a merit-based, competitive process, to institutions of higher education. Centers are to conduct and evaluate research in cognitive science, education and related fields and to develop ways in which the results of such research can be applied to the teaching of K-12 math and science. Each Center is to have a distinct research focus, determined by the Director in consultation with the National Academy of Sciences. Requires the Director to convene an annual meeting of the Centers.

Authorization of $12 million for each of fiscal years 2002 through 2006.

**SUBTITLE B. FELLOWSHIPS.**

Establishes a fellowship program for K-12 teachers to pursue education research fellowships at institutions of higher education. Grants are to be awarded on a competitive, peer-reviewed basis to institutions of higher education to set up programs that will enable K-12 teachers to conduct research on cognitive science or education research under the guidance of a researcher at the institution. Grant recipients must recruit and select teachers, give them opportunities to conduct research, and provide them with mentors and programming support. Grant recipients must provide a stipend to participating teachers and may provide room and board.

$5 million authorized for each of fiscal years 2002 through 2004.

**TITLE IV. ROBERT NOYCE SCHOLARSHIP PROGRAM.**

Establishes a competitive, merit-based grant program for institutions of higher education to obtain grants in order to award scholarships to recruit and train K-12 science and math teachers. Grant recipients are to use the funds to establish programs that encourage top college juniors and seniors majoring in science, math and engineering, as well as science, math, and engineering professionals to become K-12 science and math teachers by administering scholarships and stipends, offering programs to help scholarship/stipend recipients become certified to teach in K-12 schools, and offering programs to help scholarship/stipend recipients to become better mathematics and science teachers. Grant recipients will also offer programs to provide professional and academic support to scholarship/stipend recipients during their early years of teaching.

Scholarships for undergraduates are to be awarded for $7500 or the cost of attendance, whichever is less. Stipends for science, math, and engineering professionals are to be awarded for $7500 or the cost of tuition, whichever is less. Individuals may receive a maximum of two years' worth of support, and must agree to complete two years of teaching in a K-12 school for every year of scholarship or stipend funds awarded.

Scholarship recipients who do not complete even a single year of their service obligation would be required to pay back the amount of the award (plus interest) multiplied by two. Scholarship recipients who complete at least one year of their service obligation but do not complete the rest must repay only the total amount of their award, less $3750 for each year of service completed, plus interest.

Requires NSF Director to ensure, to the extent practicable, that partnership grants be awarded in a geographically diverse fashion, and prepare recipients for jobs in rural, urban and suburban areas.

$20 million authorized for each of fiscal years 2002 through 2005.

**TITLE V. REQUIREMENTS FOR RESEARCH CENTERS.**

Requires the Director of NSF to ensure that grants that establish new research centers at institutions of higher education incorporate an elementary and secondary mathematics, science, engineering or technology education component into their program.

## TITLE VI. MISCELLANEOUS PROVISIONS.

**SEC. 601. Mathematics and Science Proficiency Partnerships.**
Establishes an NSF program to award grants of not more than $300,000 (on a peer-reviewed, competitive basis) to local educational agencies to develop math, science, and information technology curricula, purchase equipment necessary to establish such programs, and provide professional development opportunities for teachers. In order to qualify for such a grant, the local educational agency must execute an agreement with a private sector entity to provide services and funds that include: donations of computers, establishment of internship and mentoring programs, and the provision of college scholarships for students committed to pursuing a career in math, science or information technology. Special priority is to be given to grant applicants that demonstrate the greatest economic need and the greatest ability to attract funds and services from the private sector.

$5 million authorized for each of fiscal years 2002 through 2004.

**SEC. 602. Articulation partnerships between community colleges and secondary schools.**
For grant awards authorized under section 3(c)(2) of the Scientific and Advanced-Technology Act of 1992, requires the Director to give priority to grant proposals that involve secondary schools with a majority of students from groups that are underrepresented in the science, mathematics, and engineering workforce.

$5 million authorized for each of fiscal years 2002 through 2004.

**SEC. 603. Assessment of in-service teacher professional development programs.**
Requires the Director to review all NSF programs that support teacher training programs to determine 1) what level of resources and degree of emphasis is placed on the training of teachers in the effective use of information technologies and 2) the allocation of resources between summer activities and follow-on training and support to participating teachers during the school year. Requires that a report be made to Congress on the results of the review.

## TITLE VII. EDUCATIONAL TECHNOLOGIES.

Establishes an NSF program to award grants (on a peer-reviewed, competitive basis) to institutions of higher education to establish centers to evaluate and improve the effectiveness of information technologies in K-12 math and science education. Centers would be required to identify and study the effectiveness of educational approaches and techniques that are based on the use of information technology, to identify the key variables affecting educational effectiveness, and then to ensure that the results of this analysis are widely disseminated and effectively applied by K-12 schools. Allows the Director to sponsor conferences, workshops, and websites in order to disseminate information further.

$25 million authorized for each of fiscal years 2002 through 2004; $30 million authorized for each of fiscal years 2005 and 2006.

Chairman BOEHLERT. Hearing no objections, so ordered.

The Committee will now consider H.R. 1858. I want to welcome everyone to today's Science Committee's first Full Committee markup of this Congress. I'm going to keep my remarks brief because I would like swift, smooth markups to be one of the Committee's hallmarks. When I was privileged to become Chairman of this Committee in January, I said that we would strive to have an impact on key issues facing the country. Specifically, education, energy policy and the environment. I also said I hoped we would work in a bipartisan fashion that would be a model for the entire Congress. With the help of my colleagues and the Committee staff on both sides of the aisle, today, we are carrying through on those pledges.

## H.R. 1858, As Reported by the Subcommittee on Research on June 7, 2001

**SECTION 1. SHORT TITLE.**

This Act may be cited as the "National Mathematics and Science Partnerships Act".

**SEC. 2. FINDINGS.**

The Congress finds the following:

(1) 12 years ago the President of the United States convened the Nation's Governors to establish common goals for the improvement of elementary and secondary education.

(2) Among the National Education Goals established was the goal that by the year 2000 United States students would be first in the world in mathematics and science achievement.

(3) Despite these goals, 8th graders in the United States showed just average performance in mathematics and science in the Third International Mathematics and Science Study-Repeat and demonstrated lower relative performance than the cohort of 4th graders 4 years earlier.

(4) The United States must redouble its efforts to provide all of its students with a world-class education in mathematics, science, engineering, and technology.

**SEC. 3. DEFINITIONS.**

In this Act—

(1) the term "Director" means the Director of the National Science Foundation;

(2) the term "institution of higher education" has the meaning given such term in section 101 of the Higher Education Act of 1965 (20 U.S.C. 1001);

(3) the term "eligible nonprofit organization" means a nonprofit research institute or a nonprofit professional association with demonstrated experience delivering mathematics or science education as determined by the Director;

(4) the term "local educational agency" has the meaning given such term in section 1401 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 8801); and

(5) the term "State educational agency" has the meaning given such term in section 1401 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 8801).

**SEC. 4. AUTHORIZATIONS OF APPROPRIATIONS.**

Any authorization of appropriations in this Act shall be considered to be in addition to amounts otherwise authorized or appropriated for the National Science Foundation.

**SEC. 5. MATCHING REQUIREMENTS.**

The Director may establish matching fund requirements for any programs authorized by this Act except those established in title IV.

# TITLE I—MATHEMATICS AND SCIENCE EDUCATION PARTNERSHIPS

## Subtitle A—Mathematics and Science Education Partnerships

**SEC. 101. PROGRAM AUTHORIZED.**

(a) IN GENERAL.—(1) The Director shall establish a program to award grants to institutions of higher education or eligible nonprofit organizations (or consortia thereof) to establish mathematics and science education partnership programs to improve the instruction of elementary and secondary science education.

(2) Grants shall be awarded under this section on a merit-reviewed competitive basis.

(b) PARTNERSHIPS.—(1) In order to be eligible to receive a grant under this section, an institution of higher education or eligible nonprofit organization (or consortium thereof) shall enter into a partnership with one or more local educational agencies that may also include a State educational agency or one or more businesses, or both.

(2) A participating institution of higher education shall include mathematics, science, or engineering depart-

1 ments in the programs carried out through a partnership
2 under this subsection.
3 (c) USES OF FUNDS.—Grants awarded under this
4 section shall be used for activities that draw upon the ex-
5 pertise of the partners to improve elementary or secondary
6 education, or both, in mathematics or science, or both.
7 Such activities may include—
8 (1) recruiting and preparing students for ca-
9 reers in elementary or secondary mathematics or
10 science education;
11 (2) offering professional development programs,
12 including summer or academic year institutes or
13 workshops, designed to strengthen the capabilities of
14 existing mathematics and science teachers;
15 (3) offering innovative programs that instruct
16 teachers on using technology more effectively in
17 teaching mathematics and science;
18 (4) developing distance learning programs for
19 teachers or students, including developing courses,
20 curricular materials and other resources for the in-
21 service professional development of teachers that are
22 made available to teachers through the Internet;
23 (5) offering teacher preparation and certifi-
24 cation programs for professional mathematicians,

scientists, and engineers who wish to begin a career in teaching;

(6) developing assessment tools to measure student mastery of content and cognitive skills;

(7) developing or adapting elementary and secondary school curricular materials, aligned to State standards, that incorporate contemporary research on the science of learning;

(8) developing undergraduate mathematics and science courses for education majors;

(9) using mathematicians, scientists, and engineers employed by private businesses to help recruit and train mathematics and science teachers;

(10) developing a cadre of master teachers who will promote reform and improvement in schools;

(11) developing and offering mathematics or science enrichment programs for students, including after-school and summer programs;

(12) providing research opportunities in business or academia for students and teachers;

(13) bringing mathematicians, scientists and engineers from business and academia into elementary and secondary school classrooms; and

(14) any other activities the Director determines will accomplish the goals of this section.

(d) SCIENCE ENRICHMENT PROGRAMS FOR GIRLS.—Activities carried out in accordance with subsections (c)(11) and (12) shall include elementary and secondary school programs to encourage the ongoing interest of girls in science, mathematics, engineering and technology and to prepare girls to pursue undergraduate and graduate degrees and careers in science, mathematics, engineering or technology. Funds made available through awards to partnerships for the purposes of this subsection may support programs for—

(1) encouraging girls to pursue studies in science, mathematics, engineering and technology and to major in such fields in postsecondary education;

(2) tutoring girls in science, mathematics, engineering and technology;

(3) providing mentors for girls in person and through the Internet to support such girls in pursuing studies in science, mathematics, engineering and technology;

(4) educating the parents of girls about the difficulties faced by girls to maintain an interest and desire to achieve in science, mathematics, engineering and technology, and enlisting the help of parents in overcoming these difficulties; and

1 (5) acquainting girls with careers in science,
2 mathematics, engineering and technology and en-
3 couraging girls to plan for careers in such fields.

4 **SEC. 102. SELECTION PROCESS.**

5 (a) APPLICATION.—An institution of higher edu-
6 cation or an eligible nonprofit organization (or a consor-
7 tium thereof) seeking funding under section 101 shall sub-
8 mit an application to the Director at such time, in such
9 manner, and containing such information as the Director
10 may require. The application shall include, at a
11 minimum—

12 (1) a description of the partnership and the role
13 that each member will play in implementing the pro-
14 posal;

15 (2) a description of each of the activities to be
16 carried out, including—

17 (A) how such activities will be aligned with
18 State and local standards and with other activi-
19 ties that promote student achievement in math-
20 ematics and science; and

21 (B) how such activities will be based on a
22 review of relevant research, how such activities
23 will encourage the interest of women and mi-
24 norities in science, mathematics, engineering
25 and technology and will help prepare women

and minorities to pursue postsecondary studies in these fields, and why such activities are expected to improve student performance and strengthen the quality of mathematics and science instruction;

(3) how the partnership will serve as a catalyst for reform of mathematics and science education programs; and

(4) how the partnership will assess its success.

(b) REVIEW OF APPLICATIONS.—In evaluating the applications submitted under subsection (a), the Director shall consider—

(1) the ability of the partnership to effectively carry out the proposed programs;

(2) the extent to which the members of the partnership are committed to making the partnership a central organizational focus;

(3) the degree to which activities carried out by the partnership are based on relevant research and likely to result in increased student achievement;

(4) the degree to which such activities are aligned with State or local standards; and

(5) the likelihood that the partnership will demonstrate activities that can be widely implemented as part of larger scale reform efforts.

1 (c) AWARDS.—(1) The Director shall ensure, to the
2 extent practicable, that partnership grants be awarded
3 under section 101 in a wide range of geographic areas and
4 that the partnership program include rural, suburban, and
5 urban local educational agencies.
6 (2) Not less than 50 percent of the partnerships
7 funded under section 101 shall include businesses.
8 (3) The Director shall award grants under this sub-
9 title for a period not to exceed 5 years.
10 **SEC. 103. ACCOUNTABILITY AND DISSEMINATION.**
11 (a) ASSESSMENT REQUIRED.—The Director shall
12 evaluate the partnerships program established under sec-
13 tion 101. At a minimum, such evaluations shall—
14 (1) use a common set of benchmarks and as-
15 sessment tools to identify best practices and mate-
16 rials developed and demonstrated by the partner-
17 ships; and
18 (2) to the extent practicable, compare the effec-
19 tiveness of practices and materials developed and
20 demonstrated by the partnerships authorized under
21 this subtitle with those of partnerships funded by
22 other State or Federal agencies.
23 (b) DISSEMINATION OF RESULTS.—(1) The results
24 of the evaluations required under subsection (a) shall be
25 made available to the public, including through the Na-

1 tional Science, Mathematics, Engineering, and Technology
2 Education Digital Library, and shall be provided to the
3 Committee on Science of the House of Representatives
4 and the Committee on Health, Education, Labor, and
5 Pensions and the Committee on Commerce, Science, and
6 Transportation of the Senate.

7 (2) Materials developed under the program estab-
8 lished under section 101 that are demonstrated to be ef-
9 fective shall be made available through the National
10 Science, Mathematics, Engineering, and Technology Edu-
11 cation Digital Library.

12 (c) ANNUAL MEETING.—The Director shall convene
13 an annual meeting of the partnerships participating under
14 this subtitle to foster greater national collaboration.

15 **SEC. 104. AUTHORIZATION OF APPROPRIATIONS.**

16 There are authorized to be appropriated to the Na-
17 tional Science Foundation to carry out this subtitle
18 $200,000,000 for each of fiscal years 2002 through 2006.

## 19 Subtitle B—Teacher Research
## 20 Scholarship Program

21 **SEC. 111. PROGRAM AUTHORIZED.**

22 (a) IN GENERAL.—(1) The Director shall establish
23 a program to award grants to institutions of higher edu-
24 cation or eligible nonprofit organizations (or consortia
25 thereof) to provide research opportunities in mathematics,

1 science, and engineering for elementary or secondary
2 school teachers of mathematics or science. Such institu-
3 tions of higher education or eligible nonprofit organiza-
4 tions may include one or more businesses or Federal or
5 State laboratories as partners under the program.
6 (2) Grants shall be awarded under this section on a
7 merit-reviewed competitive basis.
8 (b) PROGRAM COMPONENTS.—Grant recipients
9 under this section—
10 (1) shall recruit and select teachers and provide
11 such teachers with opportunities to conduct research
12 in academic, business, or government laboratories;
13 (2) shall ensure that the teachers have mentors
14 and other programming support to ensure that their
15 research experience will contribute to their under-
16 standing of mathematics, science, and engineering
17 and improve their performance in the classroom;
18 (3) shall provide teachers with a scholarship sti-
19 pend; and
20 (4) may provide room and board for residential
21 programs.
22 (c) USE OF FUNDS.—(1) Not more than 25 percent
23 of the funds provided under a grant under this section
24 may be used for programming support for teachers.

1 (2) The Director shall issue guidelines specifying the
2 minimum and maximum amounts of stipends recipients
3 may provide to teachers under this section.
4 (d) DURATION.—A teacher may participate in re-
5 search under the program under this section for up to 1
6 calendar year or 2 sequential summers.

7 **SEC. 112. SELECTION PROCESS.**

8 (a) APPLICATION.—An institution of higher edu-
9 cation or an eligible nonprofit organization (or a consor-
10 tium thereof) seeking funding under section 111 shall sub-
11 mit an application to the Director at such time, in such
12 manner, and containing such information as the Director
13 may require. The application shall include, at a
14 minimum—
15 (1) a description of the research opportunities
16 that will be made available to elementary or sec-
17 ondary school teachers, or both, by the applicant;
18 (2) a description of how the applicant will re-
19 cruit teachers to participate in the program and the
20 criteria that will be used to select the participants;
21 (3) a description of the number, types, and
22 amounts of the scholarships that the applicant in-
23 tends to offer to participating teachers; and
24 (4) a description of the programming support
25 that will be provided to participating teachers.

1 (b) REVIEW OF APPLICATIONS.—In evaluating the
2 applications submitted under subsection (a), the Director
3 shall consider—
4 (1) the ability of the applicant to effectively
5 carry out the proposed program;
6 (2) the extent to which the applicant is com-
7 mitted to making the program a central organiza-
8 tional focus; and
9 (3) the likelihood that the research experiences
10 and programming to be offered by the applicant will
11 improve elementary and secondary education.
12 (c) AWARDS.—(1) The Director shall ensure, to the
13 extent practicable, that grants be awarded under this sub-
14 title in a wide range of geographic areas and to assist
15 teachers from rural, suburban, and urban local edu-
16 cational agencies.
17 (2) The Director shall award grants under this sub-
18 title for a period not to exceed 5 years.
19 **SEC. 113. AUTHORIZATION OF APPROPRIATIONS.**
20 There are authorized to be appropriated for the Na-
21 tional Science Foundation to carry out this subtitle
22 $15,000,000 for each of fiscal years 2002 through 2006.

# TITLE II—NATIONAL SCIENCE, MATHEMATICS, ENGINEERING, AND TECHNOLOGY EDUCATION DIGITAL LIBRARY

**SEC. 201. IN GENERAL.**

The Director shall establish a program to expand the National Science, Mathematics, Engineering, and Technology Education Digital Library (hereinafter in this Act referred to as the "Digital Library") program to enable timely and continuous dissemination of elementary and secondary science, math, engineering, and technology educational resources, materials, practices, and policies through the Internet and other digital technologies. The expanded Digital Library shall—

(1) contain an Internet-based repository of curricular materials, practices, and teaching modules;

(2) provide users of the Digital Library with access to all materials in the Digital Library through a single entry point;

(3) contain only materials that have been peer-reviewed and tested to ensure factual accuracy and effectiveness and that are aligned with recognized State and national mathematics and science standards;

1 (4) present materials in a format that is con-
2 sistent, facilitates ease of comparison and use by
3 classroom teachers, and contains appropriate links
4 to other Federal educational clearinghouses; and
5 (5) provide materials related to mathematics
6 and science partnership programs, including—
7 (A) links to all of the programs developed
8 through the mathematics and science partner-
9 ships established under subtitle A of title I;
10 (B) data related to assessment and evalua-
11 tion and final program reports developed under
12 subtitle A of title I, including both positive and
13 negative outcomes of the program;
14 (C) materials developed by the partner-
15 ships under subtitle A of title I that have been
16 demonstrated to be effective; and
17 (D) a mechanism for users to make com-
18 ments or suggestions regarding the use and ef-
19 fectiveness of posted materials.
20 **SEC. 202. GRANTS AND CONTRACT.**
21 (a) GRANTS.—The Director may award grants to in-
22 stitutions of higher education or other qualified entities—
23 (1) to design all or parts of the Digital Library;
24 (2) to provide assistance to schools in the selec-
25 tion and adaptation of curricular materials, practices

1 and teaching methods made available through the
2 Digital Library; or
3 (3) to carry out the activities described in both
4 paragraphs (1) and (2).
5 Grants awarded under this subsection may cover the costs
6 of acquiring and reviewing educational materials for dis-
7 semination through the Digital Library.
8 (b) OPERATION.—The Director may contract out the
9 operation and management of the Digital Library.
10 (c) COMPETITIVE AWARDS.—Grants and contracts
11 shall be awarded under this section on a competitive basis.

12 **SEC. 203. AUTHORIZATION OF APPROPRIATIONS.**

13 There are authorized to be appropriated for the Na-
14 tional Science Foundation to carry out this title
15 $20,000,000 for each of fiscal years 2002 through 2006.

# 16 TITLE III—STRATEGIC EDU-
# 17 CATION RESEARCH PROGRAM

## 18 Subtitle A—Centers

19 **SEC. 301. ESTABLISHMENT OF CENTERS FOR RESEARCH**
20 **ON LEARNING AND EDUCATION IMPROVE-**
21 **MENT.**

22 (a) IN GENERAL.—(1) The Director shall award
23 grants to institutions of higher education (or consortia
24 thereof) to establish 4 multidisciplinary Centers for Re-
25 search on Learning and Education Improvement.

1 (2) Grants shall be awarded under this subsection on
2 a merit-reviewed competitive basis.
3 (b) PURPOSE.—The purpose of the Centers shall be
4 to conduct and evaluate research in cognitive science, edu-
5 cation and related fields and to develop ways in which the
6 results of such research can be applied in elementary and
7 secondary classrooms to improve the teaching of mathe-
8 matics and science.
9 (c) FOCUS.—(1) Each Center shall be focused on a
10 different challenge faced by elementary or secondary
11 school teachers of mathematics and science. In deter-
12 mining the research focus of the Centers, the Director
13 shall consult with the National Academy of Sciences and
14 take into account the extent to which other Federal pro-
15 grams support research on similar questions.
16 (2) The proposal solicitation issued by the Director
17 shall state the focus of each Center and applicants shall
18 apply for designation as a specific Center.
19 **SEC. 302. SELECTION PROCESS.**
20 (a) APPLICATION.—An institution of higher edu-
21 cation (or a consortium thereof) seeking funding under
22 this title shall submit an application to the Director at
23 such time, in such manner, and containing such informa-
24 tion as the Director may require. The application shall in-
25 clude, at a minimum a description of—

1 (1) the initial research projects that will be un-
2 dertaken by the Center and the process by which
3 new projects will be identified;
4 (2) how the Center will work with other re-
5 search institutions and schools to broaden the na-
6 tional research agenda on learning and teaching;
7 (3) how the Center will promote active collabo-
8 ration among physical, biological, and social science
9 researchers;
10 (4) how the Center will promote active partici-
11 pation by elementary and secondary mathematics
12 and science teachers and administrators; and
13 (5) how the Center will reduce the results of its
14 research to educational practice and assess the suc-
15 cess of new practices.
16 (b) REVIEW OF APPLICATIONS.—In evaluating the
17 applications submitted under subsection (a), the Director
18 shall consider—
19 (1) the ability of the applicant to effectively
20 carry out the research program and reduce its re-
21 sults to effective educational practice;
22 (2) the experience of the applicant in con-
23 ducting research on the science of teaching and
24 learning and the capacity of the applicant to foster
25 new multidisciplinary collaborations;

(3) the capacity of the applicant to attract precollege educators from a diverse array of schools and professional experiences for participation in Center activities; and

(4) the capacity of the applicant to attract and provide adequate support for graduate students to pursue research at the intersection of educational practice and basic research on human cognition and learning.

**SEC. 303. ANNUAL CONFERENCE.**

The Director shall convene an annual meeting of the Centers to foster collaboration among the Centers and to further disseminate the results of the Centers' activities.

**SEC. 304. AUTHORIZATION OF APPROPRIATIONS.**

There are authorized to be appropriated for the National Science Foundation to carry out this title $12,000,000 for each of fiscal years 2002 through 2006.

## Subtitle B—Fellowships

**SEC. 311. EDUCATION RESEARCH TEACHER FELLOWSHIPS.**

(a) ESTABLISHMENT.—(1) The Director shall establish a program to award grants to institutions of higher education or eligible nonprofit entities (or consortia thereof) to provide research opportunities related to the science of learning to elementary and secondary school teachers of science and mathematics.

1 (2) Grants shall be awarded under this section on a
2 merit-reviewed competitive basis.
3 (b) PROGRAM COMPONENTS.—Grant recipients
4 under this section—
5 (1) shall recruit and select teachers and provide
6 such teachers with opportunities to conduct research
7 in the fields of—
8 (A) brain research as a foundation for re-
9 search on human learning;
10 (B) behavioral, cognitive, affective, and so-
11 cial aspects of human learning;
12 (C) science and mathematics learning in
13 formal and informal educational settings; or
14 (D) learning in complex educational sys-
15 tems;
16 (2) shall ensure that participating teachers have
17 mentors and other programming support to ensure
18 that their research experience will contribute to their
19 understanding of the science of learning;
20 (3) shall provide programming, guidance, and
21 support to ensure that participating teachers dis-
22 seminate information about the current state of edu-
23 cation research and its implications on classroom
24 practice to other elementary and secondary edu-

1 cators and can use that information to improve their
2 performance in the classroom;
3 (4) shall provide participating teachers with a
4 scholarship stipend; and
5 (5) may provide room and board for residential
6 programs.
7 (c) USE OF FUNDS.—(1) Not more than 25 percent
8 of the funds provided under a grant under this section
9 may be used for programming support for participating
10 teachers.
11 (2) The Director shall issue guidelines specifying the
12 minimum or maximum amounts of stipends grant recipi-
13 ents may provide to teachers under this section.
14 (d) DURATION.—A teacher may participate in re-
15 search under the program under this section for up to 1
16 calendar year or 2 sequential summers.
17 (e) APPLICATION.—An institution of higher edu-
18 cation or eligible nonprofit entity (or a consortium thereof)
19 seeking funding under this section shall submit an applica-
20 tion to the Director at such time, in such manner, and
21 containing such information as the Director may require.
22 The application shall include, at a minimum—
23 (1) a description of the research opportunities
24 that will be made available to elementary or sec-
25 ondary school teachers, or both, by the applicant;

1 (2) a description of how the applicant will re-
2 cruit teachers to participate in the program, and the
3 criteria that will be used to select the participants;
4 (3) a description of the number, types, and
5 amounts of the scholarships that the applicant in-
6 tends to offer to participating teachers; and
7 (4) a description of the programming support
8 that will be provided to participating teachers to en-
9 hance their research experience and to enable them
10 to educate their peers about the value, findings, and
11 implications of education research.
12 (f) REVIEW OF APPLICANTS.—In evaluating the ap-
13 plications submitted under subsection (e), the Director
14 shall consider—
15 (1) the ability of the applicant to effectively
16 carry out the proposed program;
17 (2) the extent to which the applicant is com-
18 mitted to making the program a central organiza-
19 tional focus; and
20 (3) the likelihood that the research experiences
21 and programming to be offered by the applicant will
22 improve elementary and secondary education.
23 (g) AUTHORIZATION OF APPROPRIATIONS.—There
24 are authorized to be appropriated to the National Science

1 Foundation for carrying out this section $5,000,000 for
2 each of fiscal years 2002 through 2004.

# 3 TITLE IV—ROBERT NOYCE 4 SCHOLARSHIP PROGRAM

5 **SEC. 401. DEFINITIONS.**

6 In this title—

7 (1) the term "mathematics and science teacher"
8 means a mathematics, science, or technology teacher
9 at the elementary or secondary school level;

10 (2) the term "mathematics, science, or engi-
11 neering professional" means a person who holds a
12 baccalaureate, masters, or doctoral degree in science,
13 mathematics, or engineering and is working in that
14 field or a related area;

15 (3) the term "scholarship" means an award
16 under section 405; and

17 (4) the term "scholarship recipient" means a
18 student receiving a scholarship;

19 (5) the term "stipend" means an award under
20 section 406;

21 (6) the term "stipend recipient" means a
22 science, mathematics or engineering professional re-
23 ceiving a stipend; and

1 (7) the term "cost of attendance" has the
2 meaning given such term in section 472 of the High-
3 er Education Act of 1965 (20 U.S.C. 1087ll).

4 **SEC. 402. SCHOLARSHIP PROGRAM.**

5 (a) IN GENERAL.—(1) The Director shall establish
6 a program to award grants to institutions of higher edu-
7 cation (or consortia thereof) to provide scholarships and
8 programming designed to recruit and train mathematics
9 and science teachers. Such program shall be known as the
10 "Robert Noyce Scholarship Program".

11 (2) Grants shall be provided under this section on a
12 merit-reviewed competitive basis.

13 (b) USE OF GRANTS.—Grants provided under this
14 title shall be used by institutions of higher education—

15 (1) to develop and implement a program to en-
16 courage top college juniors and seniors majoring in
17 mathematics, science, and engineering at the grant-
18 ee's institution to become mathematics and science
19 teachers, through—

20 (A) administering scholarships in accord-
21 ance with section 405;

22 (B) offering programs to help scholarship
23 recipients to teach in elementary and secondary
24 schools, including programs that will result in
25 teacher certification; and

1 (C) offering programs to scholarship re-
2 cipients, both before and after they receive their
3 baccalaureate degree, to enable the recipients to
4 become better mathematics and science teach-
5 ers, and to exchange ideas with others in their
6 fields; or
7 (2) to develop and implement a program to en-
8 courage science, mathematics, or engineering profes-
9 sionals to become mathematics and science teachers,
10 through—
11 (A) administering stipends in accordance
12 with section 406;
13 (B) offering programs to help stipend re-
14 cipients obtain teacher certification; and
15 (C) offering programs to stipend recipi-
16 ents, both during and after matriculation, to
17 enable recipients to become better mathematics
18 and science teachers and exchange ideas with
19 others in their fields; or
20 (3) for both of the purposes described in para-
21 graphs (1) and (2).
22 **SEC. 403. SELECTION PROCESS.**
23 (a) APPLICATION.—An institution of higher edu-
24 cation (or a consortium thereof) seeking funding under
25 this title shall submit an application to the Director at

1 such time, in such manner, and containing such informa-
2 tion as the Director may require. The application shall in-
3 clude, at a minimum—

4 (1) a description of the scholarship or stipend
5 program, or both, that the applicant intends to oper-
6 ate, including the number of scholarships or the size
7 and number of stipends the applicant intends to
8 award, and the selection process that will be used in
9 awarding the scholarships or stipends;

10 (2) evidence that the applicant has the capa-
11 bility to administer the scholarship or stipend pro-
12 gram in accordance with the provisions of this title;
13 and

14 (3) a description of the programming that will
15 be offered to scholarship or stipend recipients during
16 and after their matriculation.

17 (b) REVIEW OF APPLICATIONS.—In evaluating the
18 applications submitted under subsection (a), the Director
19 shall consider—

20 (1) the ability of the applicant to effectively
21 carry out the program;

22 (2) the extent to which the applicant is com-
23 mitted to making the program a central organiza-
24 tional focus;

1 (3) the ability of the proposed programming to
2 enable scholarship or stipend recipients to become
3 successful mathematics and science teachers;
4 (4) the number and quality of the students that
5 will be served by the program; and
6 (5) the ability of the applicant to recruit stu-
7 dents who would otherwise not pursue a career in
8 teaching.

9 **SEC. 404. AWARDS.**

10 (a) DESIGNATION.—The Director shall designate in-
11 stitutions awarded grants under this title as "National
12 Teacher Scholarship Centers".
13 (b) DISTRIBUTION.—The Director shall ensure, to
14 the extent practicable, that grants be awarded under this
15 title in a wide range of geographic areas and to prepare
16 students for jobs in rural, suburban, and urban local edu-
17 cational agencies.
18 (c) DURATION.—Grants awarded under this title
19 shall be for a period of 10 years.

20 **SEC. 405. SCHOLARSHIP REQUIREMENTS.**

21 (a) IN GENERAL.—Scholarships under this title shall
22 be available only to students who are—
23 (1) majoring in science, mathematics, or engi-
24 neering; and

1 (2) in the last 2 years of a baccalaureate degree
2 program.
3 (b) SELECTION.—Individuals shall be selected to re-
4 ceive scholarships primarily on the basis of academic
5 merit, with consideration given to financial need and to
6 the goal of promoting the participation of minorities,
7 women, and people with disabilities.
8 (c) AMOUNT.—Scholarships under this title shall be
9 in the amount of $7,500 per year, or the cost of attend-
10 ance, whichever is less. Individuals may receive a max-
11 imum of 2 years of scholarship support.
12 (d) SERVICE OBLIGATION.—If an individual receives
13 a scholarship, that individual shall be required to com-
14 plete, within 6 years after graduation from the bacca-
15 laureate degree program for which the scholarship was
16 awarded, 2 years of service as a mathematics or science
17 teacher for each year a scholarship was received. Service
18 required under this subsection shall be performed at a
19 school receiving assistance under chapter 1 of title I of
20 the Elementary and Secondary Education Act of 1965
21 (Public Law 89–10).
22 **SEC. 406. STIPENDS.**
23 (a) IN GENERAL.—Stipends under this title shall be
24 available only to mathematics, science, and engineering

1 professionals who, while receiving the stipend, are enrolled
2 in a program to receive certification to teach.

3 (b) SELECTION.—Individuals shall be selected to re-
4 ceive stipends under this title primarily on the basis of
5 academic merit, with consideration given to financial need
6 and to the goal of promoting the participation of minori-
7 ties, women, and people with disabilities.

8 (c) AMOUNT.—Stipends under this title shall be for
9 an amount of up to $7,500 per year, but in no event more
10 than the cost of attendance. Individuals may receive a
11 maximum of 1 year of stipend support.

12 (d) SERVICE OBLIGATION.—If an individual receives
13 a stipend under this title, that individual shall be required
14 to complete, within 6 years after graduation from the pro-
15 gram for which the stipend was awarded, 2 years of serv-
16 ice as a mathematics or science teacher for each year a
17 stipend was received. Service required under this sub-
18 section shall be performed at a school receiving assistance
19 under chapter 1 of title I of the Elementary and Sec-
20 ondary Education Act of 1965 (Public Law 89–10).

21 **SEC. 407. CONDITIONS OF SUPPORT.**

22 As a condition of acceptance of a scholarship or sti-
23 pend under this title, a recipient shall enter into an agree-
24 ment with the institution of higher education—

1 (1) accepting the terms of the scholarship or
2 stipend pursuant to sections 405 and 409 or section
3 406;
4 (2) agreeing to provide the awarding institution
5 of higher education with annual certification of em-
6 ployment and current contact information and to
7 participate in surveys provided by the institution of
8 higher education as part of an ongoing assessment
9 program; and
10 (3) establishing that any scholarship recipient
11 shall be liable to the United States for any amount
12 that is required to be repaid in accordance with the
13 provisions of section 409.

14 **SEC. 408. COLLECTION FOR NONCOMPLIANCE.**

15 (a) MONITORING COMPLIANCE.—An institution of
16 higher education (or consortium thereof) receiving a grant
17 under this title shall, as a condition of participating in
18 the program, enter into an agreement with the Director
19 to monitor the compliance of scholarship and stipend re-
20 cipients with their respective service requirements.
21 (b) COLLECTION OF REPAYMENT.—(1) In the event
22 that a scholarship recipient is required to repay the schol-
23 arship under section 409, the institution shall be respon-
24 sible for collecting the repayment amounts.

1 (2) Except as provided in paragraph (3), any repay-
2 ment shall be returned to the Treasury of the United
3 States.
4 (3) A grantee may retain a percentage of any repay-
5 ment it collects to defray administrative costs associated
6 with the collection. The Director shall establish a single,
7 fixed percentage that will apply to all grantees.

8 **SEC. 409. FAILURE TO COMPLETE SERVICE OBLIGATION.**

9 (a) GENERAL RULE.—If an individual who has re-
10 ceive a scholarship under this title—
11 (1) fails to maintain an acceptable level of aca-
12 demic standing in the educational institution in
13 which the individual is enrolled, as determined by
14 the National Science Foundation;
15 (2) is dismissed from such educational institu-
16 tion for disciplinary reasons;
17 (3) withdraws from the baccalaureate degree
18 program for which the award was made before the
19 completion of such program;
20 (4) declares that the individual does not intend
21 to fulfill his service obligation under this title; or
22 (5) fails to fulfill the service obligation of the
23 individual under this title,
24 such individual shall be liable to the United States as pro-
25 vided in subsection (b).

1 (b) AMOUNT OF REPAYMENT.—(1) If a circumstance
2 described in subsection (a) occurs before the completion
3 of one year of a service obligation under this title, the
4 United States shall be entitled to recover from the indi-
5 vidual, within one year after the date of the occurrence
6 of such circumstance, an amount equal to—
7 (A) the total amount of awards received by
8 such individual under this title; plus
9 (B) the interest on such amounts which would
10 be payable if at the time the amounts were received
11 they were loans bearing interest at the maximum
12 legal prevailing rate, as determined by the Treasurer
13 of the United States,
14 multiplied by 2.
15 (2) If a circumstance described in subsection (a)(4)
16 or (a)(5) occurs after the completion of one year of a serv-
17 ice obligation under this title, the United States shall be
18 entitled to recover from the individual, within one year
19 after the date of the occurrence of such circumstance, an
20 amount equal to—
21 (A) the total amount of awards received by
22 such individual under this title minus $3,750 for
23 each full year of service completed; plus
24 (B) the interest on such amounts which would
25 be payable if at the time the amounts were received

1 they were loans bearing interest at the maximum
2 legal prevailing rate, as determined by the Treasurer
3 of the United States.

4 (c) EXCEPTIONS.—(1) The National Science Founda-
5 tion may provide for the partial or total waiver or suspen-
6 sion of any service obligation or payment by an individual
7 under this title whenever compliance by the individual is
8 impossible or would involve extreme hardship to the indi-
9 vidual, or if enforcement of such obligation with respect
10 to the individual would be unconscionable.

11 (2) Any obligation of an individual under this title
12 for payment under subsection (b) may be released by a
13 discharge in bankruptcy under title 11, United States
14 Code, only if such discharge is granted after the expiration
15 of the 5-year period beginning on the first date that such
16 payment is required.

17 **SEC. 410. AUTHORIZATION OF APPROPRIATIONS.**

18 (a) IN GENERAL.—There are authorized to be appro-
19 priated to the National Science Foundation to carry out
20 this title $20,000,000 for each of fiscal years 2002
21 through 2005.

22 (b) SPECIFIC APPROPRIATIONS.—There are author-
23 ized to be appropriated to the National Science Founda-
24 tion to support the activities described in subsections
25 (b)(1)(A) and (C) and (b)(2)(A) and (C) of section 402,

1 such sums as may be necessary for each of fiscal years
2 2006 through 2011.

# 3 TITLE V—REQUIREMENTS FOR 4 RESEARCH CENTERS

**5 SEC. 501. REQUIREMENTS FOR RESEARCH CENTERS.**

6 The Director shall ensure that any National Science
7 Foundation program that awards grants for the establish-
8 ment of research centers at institutions of higher edu-
9 cation after the date of the enactment of this Act—

10 (1) requires that every center offer programs
11 for elementary and secondary mathematics and
12 science teachers and students to increase their un-
13 derstanding of the field in which the center special-
14 izes; and

15 (2) uses the quality of a center's proposed
16 precollege education programs as a criterion in de-
17 termining grant awards.

# 18 TITLE VI—EDUCATIONAL 19 TECHNOLOGIES

**20 SEC. 601. EDUCATIONAL TECHNOLOGY RESEARCH CEN-
21 TERS.**

22 (a) IN GENERAL.—(1) The Director shall establish
23 a program to award grants to institutions of higher edu-
24 cation (or consortia thereof) to establish centers to evalu-
25 ate and improve the effectiveness of information tech-

1 nologies in elementary and secondary mathematics and
2 science education.
3 (2) Grants shall be awarded under this title on a
4 merit-reviewed competitive basis.
5 (b) ACTIVITIES.—Centers established under this title
6 shall, at a minimum—
7 (1) identify educational approaches and tech-
8 niques that are based on the use of information
9 technology and that have the potential for being ef-
10 fective in classroom settings;
11 (2) develop methods to measure the effective-
12 ness of various applications of information tech-
13 nology in mathematics and science education, includ-
14 ing methods to measure student performance;
15 (3) evaluate the effectiveness of the use of tech-
16 nology in elementary and secondary mathematics
17 and science education in a variety of classroom set-
18 tings; and
19 (4) identify the key variables that influence
20 educational effectiveness and the conditions nec-
21 essary to implement successfully an approach or
22 technique determined to be educationally effective
23 for a particular educational setting;
24 (5) ensure that the results of such evaluations
25 are widely disseminated; and

1 (6) develop a program to work with local edu-
2 cational agencies to help them apply the results of
3 the research conducted under this section.

4 **SEC. 602. SELECTION PROCESS.**

5 (a) APPLICATION.—An institution of higher edu-
6 cation (or a consortium thereof) seeking funding under
7 this title shall submit an application to the Director at
8 such time, in such manner, and containing such informa-
9 tion as the Director may require. The application shall in-
10 clude, at a minimum, a description of—

11 (1) the approaches to the use of information
12 technology that the center will initially evaluate, how
13 it chose those approaches, how it will seek out any
14 additional approaches, and how assessment proce-
15 dures would be developed and applied;

16 (2) how the center will work with local edu-
17 cation agencies to evaluate the approaches in class-
18 rooms;

19 (3) how the center will disseminate the results
20 of its work; and

21 (4) how the center will develop an outreach pro-
22 gram to work with local educational agencies to help
23 them apply the results of its research.

24 (b) REVIEW OF APPLICATIONS.—In evaluating the
25 applications submitted under subsection (a), the Director

1 shall consider the ability of the applicant to effectively
2 evaluate information technology approaches and to help
3 local education agencies apply the results of those evalua-
4 tions.

5 (c) AWARDS.—The Director shall ensure, to the ex-
6 tent practicable, that the program established under this
7 title evaluates information technology—

8 (1) in a wide range of grade levels and geo-
9 graphic areas;

10 (2) in rural, suburban, and urban schools; and

11 (3) with a wide variety of students in terms of
12 race, ethnicity, and affluence.

13 **SEC. 603. DOCUMENTATION AND DISSEMINATION OF RE-**
14 **SULTS.**

15 (a) IN GENERAL.—The results of the research and
16 evaluations conducted in accordance with section 601 shall
17 be documented and widely disseminated, including
18 through publication in peer-reviewed scholarly journals.

19 (b) WORKSHOPS, CONFERENCE, AND WEB SITES.—
20 The Director is authorized to sponsor and support work-
21 shops, conferences, and dedicated web sites to disseminate
22 information about the activities of the educational tech-
23 nology research centers established under section 601.

24 (c) DEPOSIT IN LIBRARY.—Information about effec-
25 tive approaches and techniques, including information and

1 materials necessary for their implementation, shall be de-
2 posited in the Digital Library.

3 **SEC. 604. AUTHORIZATION OF APPROPRIATIONS.**

4 There are authorized to be appropriated to the Na-
5 tional Science Foundation to carry out the program estab-
6 lished under section 601—

7 (1) $25,000,000 for each of fiscal years 2002
8 through 2004; and

9 (2) $30,000,000 for each of fiscal years 2005
10 and 2006.

# 11 TITLE VII—MISCELLANEOUS 12 PROVISIONS

13 **SEC. 701. MATHEMATICS AND SCIENCE PROFICIENCY**
14 **PARTNERSHIPS.**

15 (a) FINDINGS.—Congress finds the following:

16 (1) Proficiency in mathematics, science, and in-
17 formation technology is necessary to prepare all stu-
18 dents in the United States for participation in the
19 21st Century and to guarantee that the United
20 States economy remains vibrant and competitive.

21 (2) In order to achieve such results, it is impor-
22 tant that the Federal Government shows interest in
23 economically disadvantaged students who have not
24 been provided with opportunities that will improve

1 their knowledge of mathematics, science, and tech-
2 nology.
3 (3) Many economically disadvantaged students
4 in urban and rural America share a common need
5 to receive a quality education, but often the schools
6 of such students lack the needed resources to lift
7 those students into the information age.
8 (4) The schools and businesses serving urban
9 and rural communities are strategically positioned to
10 form a unique partnership with students that will in-
11 crease their mathematics, science, and technology
12 proficiency and encourage and support their under-
13 graduate study in those fields for the benefit of the
14 Nation.
15 (b) AUTHORITY.—(1)(A) The Director shall establish
16 a demonstration project under which the Director awards
17 grants in accordance with this section to eligible local edu-
18 cational agencies.
19 (B) A local educational agency that receives a grant
20 under this section may use such grant funds to develop
21 a program that builds or expands mathematics, science,
22 and information technology curricula, to purchase equip-
23 ment necessary to establish such program, and to provide
24 professional development to enhance teacher quality in
25 those fields.

1 (2) A program described in paragraph (1) shall—
2 (A) provide teacher professional development
3 specifically in information technology, mathematics,
4 and science; and
5 (B) provide students with a rich standards-
6 based course of study in mathematics, science, and
7 information technology.
8 (c) ELIGIBLE LOCAL EDUCATIONAL AGENCIES.—
9 For purposes of this section, a local educational agency
10 is eligible to receive a grant under this section if the
11 agency—
12 (1) provides assurances that it has executed
13 conditional agreements with representatives of the
14 private sector to provide services and funds de-
15 scribed in subsection (d); and
16 (2) agrees to enter into an agreement with the
17 Director to comply with the requirements of this sec-
18 tion.
19 (d) PRIVATE SECTOR PARTICIPATION.—The condi-
20 tional agreements referred to in subsection (c)(1) shall de-
21 scribe participation by the private sector, including—
22 (1) the donation of computer hardware, soft-
23 ware, and other technology tools;
24 (2) the establishment of internship and men-
25 toring opportunities for students who participate in

1 the mathematics, science, and information tech-
2 nology program; and
3 (3) the donation of higher education scholarship
4 funds for eligible students to continue their study of
5 mathematics, science, and information technology.
6 (e) APPLICATION.—(1) To apply for a grant under
7 this section, each eligible local educational agency shall
8 submit an application to the Director in accordance with
9 guidelines established by the Director pursuant to para-
10 graph (2).
11 (2)(A) The guidelines referred to in paragraph (1)
12 shall require, at a minimum, that the application
13 include—
14 (i) a description of proposed activities con-
15 sistent with the uses of funds and program require-
16 ments under paragraphs (1)(B) and (2) of sub-
17 section (b);
18 (ii) a description of the higher education schol-
19 arship program, including criteria for selection, du-
20 ration of scholarship, number of scholarships to be
21 awarded each year, and funding levels for scholar-
22 ships; and
23 (iii) evidence of private sector participation and
24 financial support to establish an internship, men-
25 toring, and scholarship program.

1 (B) The Director shall issue and publish such guide-
2 lines not later than 6 months after the date of the enact-
3 ment of this Act.
4 (3) The Director shall select a local educational agen-
5 cy to receive an award under this section on the basis of
6 merit to be determined after conducting a comprehensive
7 review.
8 (f) PRIORITY.—The Director shall give special pri-
9 ority in awarding grants under this section to eligible local
10 educational agencies that—
11 (1) demonstrate the greatest ability to obtain
12 commitments from representatives of the private sec-
13 tor to provide services and funds described under
14 subsection (d); and
15 (2) demonstrate the greatest economic need.
16 (g) ASSESSMENT.—The Director shall assess the ef-
17 fectiveness of activities carried out under this section.
18 (h) STUDY AND REPORT.—The Director—
19 (1) shall initiate an evaluative study of the ef-
20 fectiveness of the activities carried out under this
21 section in improving student performance in mathe-
22 matics, science, and information technology at the
23 precollege level and in stimulating student interest
24 in pursuing undergraduate studies in those fields;
25 and

1 (2) shall report the findings of the study to
2 Congress not later than 4 years after the award of
3 the first scholarship.
4 Such report shall include the number of students grad-
5 uating from an institution of higher education with a
6 major in mathematics, science, or information technology
7 and the number of students who find employment in such
8 fields.
9 (i) DEFINITIONS.—In this section:
10 (1) The term "conditional agreement" means
11 an arrangement between representatives of the pri-
12 vate sector and local educational agencies to provide
13 certain services and funds, such as, but not limited
14 to, the donation of computer hardware and software,
15 the establishment of internship and mentoring op-
16 portunities for students who participate in mathe-
17 matics, science, and information technology pro-
18 grams, and the donation of scholarship funds for use
19 at institutions of higher education by eligible stu-
20 dents who have participated in the mathematics,
21 science, and information technology programs.
22 (2) The term "eligible student" means a stu-
23 dent enrolled in the 12th grade who—

1 (A) has participated in a mathematics,
2 science, and an information technology program
3 established pursuant to this section;
4 (B) has demonstrated a commitment to
5 pursue a career in information technology,
6 mathematics, science, or engineering; and
7 (C) has attained high academic standing
8 and maintains a grade point average of not less
9 than 2.7 on a 4.0 scale for the period from the
10 beginning of the 10th grade through the time
11 of application for a scholarship.
12 (j) AUTHORIZATION OF APPROPRIATIONS.—There
13 are authorized to be appropriated to the National Science
14 Foundation to carry out this section $5,000,000 for each
15 of fiscal years 2002 through 2004.
16 (k) MAXIMUM GRANT AWARD.—An award made to
17 an eligible local educational agency under this section may
18 not exceed $300,000.

19 **SEC. 702. ARTICULATION PARTNERSHIPS BETWEEN COM-**
20 **MUNITY COLLEGES AND SECONDARY**
21 **SCHOOLS.**

22 (a) OUTREACH GRANTS.—In making awards for out-
23 reach grants authorized under section 3(c)(2) of the Sci-
24 entific and Advanced-Technology Act of 1992 (42 U.S.C.
25 1862i(c)(2)), the Director shall give priority to proposals

1 that involve secondary schools with a majority of students
2 from groups that are underrepresented in the science,
3 mathematics and engineering workforce. Awards in such
4 cases shall not be subject to the requirement under section
5 3(f)(3) of such Act for a matching contribution.

6 (b) AUTHORIZATION OF APPROPRIATIONS.—There
7 are authorized to be appropriated to the National Science
8 Foundation to carry out this section $5,000,000 for each
9 of fiscal years 2002 through 2004.

10 **SEC. 703. ASSESSMENT OF IN-SERVICE TEACHER PROFES-**
11 **SIONAL DEVELOPMENT PROGRAMS.**

12 (a) ASSESSMENT.—The Director shall review all pro-
13 grams sponsored by the National Science Foundation that
14 support in-service teacher professional development for
15 science teachers to determine—

16 (1) the level of resources and degree of empha-
17 sis placed on training teachers in the effective use of
18 information technology in the classroom; and

19 (2) the allocation of resources between summer
20 activities and follow-on reinforcement training and
21 support to participating teachers during the school
22 year.

23 (b) REPORT.—The Director shall submit to Congress,
24 not later than 1 year after the date of the enactment of
25 this Act, a report that—

1 (1) describes the results of the review and as-
2 sessment conducted under subsection (a);
3 (2) summarizes the major categories of in-serv-
4 ice teacher professional development activities sup-
5 ported at the time of the review, and the funding
6 levels for such activities; and
7 (3) describes any proposed changes, including
8 new funding allocations, to strengthen the in-service
9 teacher professional development programs of the
10 National Science Foundation that support activities
11 described in paragraphs (a)(1) and (2).

Chairman BOEHLERT. We have before us two thoughtful, innovative, bipartisan bills that should have a significant impact on improving pre-college education. Both my bill and Dr. Ehlers' bill are designed to ensure that the resources and expertise of higher education and the business community are brought to bear on K through 12 education. And both bills recognize that the most essential element of education is ensuring that we have the brightest, most creative, best prepared teachers in our nation's classrooms. Everything else is just icing on the cake.

Both bills have benefited from guidance on both sides of the aisle. My bill, for example, builds on the recommendations of President Bush, who in his budget, recognized the important education role of the National Science Foundation and of partnerships.

It also includes a number of proposals that originated with Committee Democrats and were included in Mr. Hall's education package, H.R. 1653. And it includes my proposal of the Noyce Scholarships, which the concept was developed several years ago on a bipartisan basis with Senator Rockefeller. This is designed to attract top math and science majors into teaching.

This is the way to pull together an education bill. Reach across the aisle, avoid ideological disputation, stick to practical ways the Federal Government can catalyze reform. I hope we can stick to these principles when we report out an energy bill next month.

At any rate, H.R. 1858 and H.R. 100 are bills everyone on this Committee can be proud of and, most important, they should make a difference to America's students. H.R. 1858 has already been endorsed by a number of education groups and more will be signing on in the coming weeks. There is already bipartisan interest in the bill in the Senate. And we expect to bring this bill to the floor rapidly, where it should pass easily.

So these bills are not just statements of position or rhetorical exercises. We expect them to become law. And we will work with the appropriators and the National Science Foundation to see that they begin helping America's students as soon as possible.

Before turning to Mr. Hall, just let me say, I'd like to congratulate the excellent work of the very able professional staff, Republican and Democrat alike. We are all in this together and you have done us proud. Mr. Hall?

[Statement of Ralph M. Hall follows:]

OPENING STATEMENT OF HON. RALPH HALL

Mr. Chairman, I am pleased to join you in support of this important legislation to strengthen science and mathematics education in the nation's schools.

I congratulate you for placing science education high on the Committee's agenda for this year and for taking the steps necessary to move this legislation forward.

The bill before the Committee is the result of bipartisan effort.

It is composed of several programs and activities authorized for the National Science Foundation. I believe the extensive hearing record the Committee has compiled over the past three years provides ample support for the provisions of the bill.

The Democratic Members of the Committee have separately developed several legislative proposals to improve K–12 science and math education. In addition, with their help, I developed a comprehensive education bill, HR 1693, which I introduced earlier this year.

I am pleased that many of the programs an activities set out in these Democratic bills are included in the Committee markup vehicle before us.

In particular, I would like to highlight the programs incorporated from HR 1693 that explore ways to effectively use educational technologies in the classroom. The emphasis is on determining the techniques and approaches that lead to improved

student performance, so that schools will know which approaches actually work and are worth the substantial investments involved in implementing them.

Also, the markup vehicle incorporates programs from HR 1693 to encourage and support women and minorities in pursuing careers in science and engineering. The changing composition of the nation's workforce makes it essential that the talents of all segments of society are fully developed and utilized.

We will soon consider a managers' amendment, which I am co-sponsoring with the Chairman, that incorporates several additional provisions championed by Democratic Members.

Mr. Chairman, I want to acknowledge the collegial process through which this bipartisan legislation has been developed. And, I want to congratulate Chairman Nick Smith and Ranking Member Eddie Bernice Johnson of the Research Subcommittee for their efforts to develop the bill.

Finally, I want to thank you, Mr. Chairman, for your willingness to work cooperatively with Democratic Members to develop this legislation, and for bringing it before the Committee today.

Mr. HALL. Mr. Chairman, thank you very much. And I am, of course, pleased to join you in support of this very important legislation to strengthen science and mathematics education in the nation's school. And I admire the way that you are running this Committee. I have some problems, though, I know there is going to be a time when your unanimous consent requests are going to be more interesting when we get to energy. I want to wait and see exactly how you handle that. I congratulate you, of course, for placing science education on the Committee's agenda for this year. And you have done that. You have put it up front. And I think that is where it belongs. And that is what our President has indicated, his interest in education and furthering some areas of improvement of this very important facet of our Nation's economy and our Nation's future.

The bill before the Committee is a result, as you say, of bipartisan effort that is composed of several programs and activities authorized for the National Science Foundation. I think the extensive hearing record that the Committee compiled over the last 3 years, which, Mr. Chairman, you have been here and been a part of, provides ample support for the provisions of the bill. And that may be another reason why we will slide right on through this presentation today and I think you have deadened the timber over in the Senate for it and that is an admirable thing to do.

The Democratic members of the Committee have separately developed some legislative proposals to improve K–12 science and math education. In addition to their help, we have developed a comprehensive education bill, H.R. 1693, which as the Chairman has said, I introduced earlier this year. I am pleased that many of the programs and activities set out in these Democratic bills are included in the Committee Markup vehicle before us today. In particular, I would like to highlight the programs incorporated from H.R. 1693 that explore ways to effectively use educational technologies in the classroom. Now, the emphasis is on determining the techniques and approaches that lead to improve student performance. So that helps schools to know which approaches actually work. And I think they are worth the substantial investments that are involved and it is good to know that they understand this to the point that they will use those investments involved in implementing them.

Also, the Markup vehicle incorporates programs from H.R. 1693 to encourage and support women and minorities in pursuing careers in science and engineering.

And, Mr. Chairman, with all the talk of opening up our borders to bring people in from oversees to man the positions of labor and even management and skilled people that they are talking about increasing immigration for that, I think that points up the importance of the changing composition of the Nation's workforce. Make it very essential that all segments of society are fully developed and fully utilized. And that way, we are going to have to rely less on having those from other countries come to take these very important jobs that we are supporting here.

Mr. HALL. So we will soon consider a Manager's Amendment, which I have co-sponsored with the Chairman that incorporates several additional provisions, championed by members from both sides. Mr. Chairman, I acknowledge the affordable process through which this legislation has been developed. And I want to congratulate chairman Nick Smith and Ranking Member Eddie Bernice Johnson of the Research Subcommittee for their efforts to develop this bill.

And finally, Mr. Chairman, I want to, once again, thank you for your willingness to work cooperatively with Democratic Members to develop this legislation and for bringing it before the Committee today. I yield back my time.

Chairman BOEHLERT. Thank you very much for those kind remarks, Mr. Hall. Without objection, all members may place opening statements in the record at this point. I ask unanimous consent that the bill be considered as read and open to amendment at any point. And I ask members to proceed with the statements in the order on the roster.

OPENING STATEMENT OF HON. BOB ETHERIDGE

Thank you Mr. Chairman for recognizing me. One of the most difficult challenges we face today is getting well trained and qualified science and math teachers in every classroom. One of the pieces that I am very pleased to see in this bill is an amendment that directs the National Science Foundation to establish a program to improve the undergraduate education and in-service professional development of science and mathematics teachers in elementary and secondary school.

As the former Superintendent of Schools in North Carolina, I have worked for many years to improve science and math education in our schools. We need better-qualified teachers in our K–12 science and math classrooms. There is a need for teacher enhancement and professional development for current teachers. Our teachers are not being adequately prepared in both the content and the techniques of teaching. At the very root of our problems is Teacher Preparation. In the long run, we would benefit more if we allocate resources to invest more in the undergraduate preparation of teachers.

There is growing recognition that the success of nearly any effort to improve the academic performance of America's students depends critically upon their teachers' mastery of subject matter and their ability to teach it. The way to lift student achievement is to ensure that we have a qualified teacher in every classroom. Therefore, if America is to improve its public schools, teacher preparation and enhancement must become the first priority of education reform. I am pleased this bill takes several steps in that direction.

Last year, I introduced a similar measure as an amendment to the bill the Science Committee has passed but that was never enacted. This year I expanded on that effort in the Hall bill and I am pleased H.R. 1858 builds on this function to strengthen science education in America.

I urge adoption of this bill.

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OPENING STATEMENT OF HON. MICHAEL M. HONDA

Thank you, Mr. Chairman.

Let me begin by thanking Chairmen Boehlert and Smith, as well as Ranking Members Hall and Johnson, for creating a climate of inclusiveness and cooperation.

This bill and its expeditious passage will be a testament to the great work that can be accomplished when both sides of the aisle work together.

I ask for recognition today because there are two provisions within the Manager's Amendment that I have offered.

The first provision authorizes the National Science Foundation to provide grants to undergraduate and graduate students that go into our schools for the express purpose of assisting our teachers better utilize computers.

It was once conventional wisdom that if we merely put computers in classrooms, the quality of our children's education would dramatically improve. No doubt, our schools are better because of the presence of computers, but we have learned in these few short years, that our teachers must be better trained and assisted if we are to maximize the use of computers and the Internet in schools.

Many of our nation's undergraduate and graduate students have expertise in computer science. We need to draw on this wealth of expertise, as well as the altruism and idealism that so many of young people harbor.

By coupling the specific needs of our school systems with the energy and intellect of some of the brightest people in our academic institutions, we can better begin to prepare our children with the high tech skills they need to navigate, adapt and succeed in the Knowledge Economy.

But the challenges our children face will not be relegated to the career world. For example, our children, one day, will address the same energy challenges that we face today.

Future generations of Americans will need to continue the important work of creating a balanced energy portfolio on which our country can rely and prosper.

That is why I have included language in the Manager's Amendment that would make more explicit NSF"s responsibility to encourage the development of energy curriculum for primary and secondary school children.

In the midst of an energy crisis that is wreaking great havoc on the Western states, our nation is giving more thought and consideration to the important role that energy conservation and renewable energies can play in our energy portfolio.

It will be important to tap our children into this discussion as early as possible, so that when they purchase homes, cars and dishwashers, they will be smart energy consumers. We must not pass onto our children the myth that fossil fuels are the only reliable and abundant source of energy for the United States.

My hope and expectation is that, one day, every school in America will offer students an energy curriculum that accurately reflects, not only the great energy demands we will face in coming years, but also the extraordinary resources that might be available to us if only we invest ourselves in them. I speak of wind and solar energy, as well as biomass and geothermal.

Such a curriculum must also speak to the great benefits of energy conservation. As a California Member of Congress, I understand the importance of conservation, but implementing such a system is not easy. It requires educating the public, so let's start early * * * let's teach our children to think more about the amount of energy they use.

Again, I'm pleased that these provisions have been included in the Manager's Amendment and I look forward to the Amendment's passage.

As a former science teacher, principal and school board member, I'm extraordinarily pleased that this Committee is marking up such a strong, bipartisan science education bill that, in my opinion, will better prepare our children for future challenges and opportunities.

Thank you.

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OPENING STATEMENT OF HON. JAMES A. BARCIA

Thank you Ranking Member Hall. I also wish to thank Chairman Boehlert for his willingness to work with me in such a bipartisan manner to craft this portion of the Manager's Amendment.

My provision in this manager's amendment incorporates much of H.R. 1889, the Educational Technology Utilization Extension Assistance Act, a bill I introduced, along with my colleagues David Wu and Mark Udall. This section directs the National Science Foundation to work with the Department of Education to create educational technology extension centers.

The focus on these centers is to advise and assist local K–12 schools to better utilize and integrate their existing educational technology infrastructure into their curriculum and classroom, as well as help schools evaluate their need for new information technologies.

This provision addresses a problem identified by school administrators, independent educational organizations and scores of teachers, that more support resources are needed to maximize the use of technology in the classroom.

Education technology centers will enhance the services provided by those who are currently providing assistance to teachers, like local intermediate school districts. Where this type of technical advice is not available, this legislation would initiate this important effort.

Mr. Chairman, there simply are not enough hours in the day for our teachers to meet the demands placed on them in the classroom and to take the time needed to research all of the new technologies available for their students.

I believe by establishing centers dedicated solely to provide teachers with information and training to effectively utilize available technology, we will allow teachers to provide their students with the resources necessary to equip them for the 21st century.

I urge my colleagues to support the adoption of this manager's amendment.

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OPENING STATEMENT OF HON. SHEILA JACKSON LEE

Mr. Chairman, I would like to thank you and Ranking Member Ralph Hall for this opportunity to markup, H.R. 1858, which would make improvements in mathematics and science education in our nation, and H.R. 100, the National Science and Education Act. These bills are long overdue and are much needed in ensuring that we have adequate numbers of trained scientists and mathematicians for the technological and economic challenges of tomorrow.

H.R. 1858 offers support to current teachers and help to recruit and retain new teachers who are trained and accredited to teach math and science.

In order to accomplish the goals of this legislation it would create new approaches for the Nations Science Foundation (NSF) to take in building a stronger and more diverse repository of mathematics and science trained teachers. The long range goal is to provide instruction in math and science by teachers who are trained in those areas, and through this effort increase the number of students who pursue math and science undergraduate and graduate degrees.

It is my goal along with the committee's to create a public education system that would develop a technologically capable workforce that can compete in the global economy.

Toward this end, I have offered several amendments to H.R. 1858. The first amendment directs that the National Digital Library contain information about electronic links to materials that educators may access. The second amendment requires that research center awards focus on research and development of educational practices designed to improve the academic performance of a broad range of students including those from underrepresented groups.

Through the committee hearing process on these particular bills the groups that are underrepresented have been identified as African Americans, Hispanics, Native Americans and women.

The last amendment directs that the NSF provide information on the awarding of Robert Noyce Scholarships. As a result of this amendment the NSF will be required to collect relevant statistically and demographic data on scholarship recipients and information on the locations at which scholarship recipients carry out their teaching requirement. This report is required by year 7 of the program assessing its impact on drawing math and science students into teaching careers, including students from underrepresented groups.

I thank the Chair and committee members for their consideration of these amendments and look forward to their inclusion in the final bill sent to the House by this committee.

Thank you.

The first amendment on the roster is the Manager's Amendment, offered by the Ranking Minority Member, Mr. Hall and myself. I ask unanimous consent that the Manager's Amendment be considered En Bloc. Without objection, so ordered. Clerk will report the amendment.

Ms. CLERK. En Block amendments to H.R. 1858, offered by Mr. Boehlert and Mr. Hall.

# SECTION-BY-SECTION DESCRIPTION OF AMENDMENT TO H.R. 1858 TO BE OFFERED BY MR. BOEHLERT AND MR. HALL

**Sec. 2. Findings.**
Adds a new finding that American economic expansion has been the result of the hard work and innovation of its citizens and not the result of government planning or intervention.

**Sec. 3. Definitions.**
Adds the standard definitions for the terms "elementary school" and "secondary school".

**Title I (Mathematics and Science Partnerships)**

**Sec. 101 (c) Uses of Funds.**
Permits partnerships to utilize funds to recruit and train college students to provide technical support to teachers who are using technology to teach mathematics and science.

**Sec. 101(e) Research in Secondary Schools.**
Adds a subsection that specifies that allowable activities for partnerships may include support for research projects performed by students at secondary schools. Permits funds used for these purposes to be used to train teachers to design research projects and for stipends for teachers or students participating in research or training activities not part of their typical classroom activities.

**Sec.102. Selection Process.**
Requires applicants intending to utilize funds for stipends to describe in their application for funds the number, size, nature and need for the stipends. Clarifies that when reviewing applications for grants the Director may take into consideration additional items not specifically identified in the section pertaining to review of applications.

**Sec. 112. Selection Process.**
Clarifies that when reviewing applications for grants to participate in the teacher research scholarship program the Director may take into consideration additional items not specifically identified in the section pertaining to review of applications.

**Title II (National Science Mathematics, Engineering, and Technology Education Digital Library)**

**Sec. 201. In General.**
Adds requirement that to the extent practicable the library shall include a repository of information about national and regional education conferences.

**Title III (Strategic Education Research Program)**

**Sec. 302. Selection Process.**
Clarifies that when reviewing applications the Director may take into consideration additional items not specifically identified in the section pertaining to review of applications.

**Sec. 302 (c) Awards.**
Adds a new subsection requiring the Director, to the extent practicable, to ensure that the research centers conduct research and develop educational practices designed to improve the performance of a broad range of students including those from underrepresented groups.

**Sec. 311(f) Review of Applications.**
Clarifies that when reviewing applications the Director may take into consideration additional items not specifically identified in the section pertaining to review of applications.

**Title IV (Robert Noyce Scholarship Program)**

**Sec. 410. Report.**
Adds section requiring that institutions receiving grants under this title supply the Director with such relevant statistical or demographic data on scholarship and stipend recipients (including employment data) as the Director may request. Requires that the Director assess and report to Congress on the degree to which the program encourages high quality students (including those from underrepresented groups) to become teachers.

**Title VI (Educational Technologies Research)**

**Sec. 602. Selection Process.**
Clarifies that when reviewing applications the Director may take into consideration additional items not specifically identified in the statute. Makes technical correction by replacing "affluence" with "income".

**Sec. 704. Instructional Materials.**
Adds section authorizing the Director of NSF to award grants for the development of educational materials on energy production and use, energy conservation, and renewable energy.

**Sec. 705. Study of Broadband Network Access for Schools and Libraries.**
Adds section requiring the Director to conduct a study of the current status of broadband network access of public elementary, secondary schools and libraries to the Internet; ways that broadband access can be utilized effectively; regional circumstances that may impact on the ability of schools and libraries to obtain broadband access; and recommendations on ways to address any issues identified.

**Sec. 706. Educational Technology Assistance.**
Adds section amending the Scientific and Advanced Technology Act of 1992 to authorize the Director to make grants to institutions of higher education to establish centers to assist elementary and secondary schools in the use of information technology. No institutions may receive an award for more than three years.

**Sec. 706(e) Learning Community Consortium**
Authorizes the Director to award a grant to a consortium of community colleges for the purposes of conducting a pilot program to encourage women, minorities, and persons with disabilities to enter and complete mathematics, science, and engineering programs.

COMMITTEE ON SCIENCE

FULL COMMITTEE MARKUP

JUNE 13, 2001

AMENDMENT ROSTER

H.R. 1858, National Mathematics and Science Partnerships Act

| No. | Sponsor | Description | Results |
|---|---|---|---|
| 1. | Mr. Boehlert and Mr. Hall | En Bloc Amendments to H.R. 1858 | |
| | | | |
| | | | |
| | | | |

## EN BLOC AMENDMENTS TO H.R. 1858
## OFFERED BY MR. BOEHLERT AND MR. HALL

Page 1, after line 23, insert the following:

1 (5) The American economy has become the
2 most robust in the world, not through state planning
3 and government intervention, but through the hard
4 work and innovation of its citizens. This success is
5 founded in our Constitutional tradition of respect for
6 individual liberty to pursue personal career objec-
7 tives.

Page 2, line 17, strike "and".

Page 2, line 21, strike the period and insert a semicolon.

Page 2, after line 21, insert the following:

8 (6) the term "elementary school" has the mean-
9 ing given that term by section 14101(14) of the Ele-
10 mentary and Secondary Education Act of 1965 (20
11 U.S.C. 8801(14)); and
12 (7) the term "secondary school" has the mean-
13 ing given that term by section 14101(25) of the Ele-
14 mentary and Secondary Education Act of 1965 (20
15 U.S.C. 8801(25)).

Page 4, line 17, after "science" insert: ", including programs that recruit and train undergraduate and graduate students to provide technical support to teachers".

Page 7, after line 3, add the following new subsections:

1 (e) RESEARCH IN SECONDARY SCHOOLS.—Activities
2 carried out in accordance with subsection (c)(11) may in-
3 clude support for research projects performed by students
4 at secondary schools. Uses of funds made available
5 through awards to partnerships for purposes of this sub-
6 section may include—
7 (1) training secondary school mathematics and
8 science teachers in the design of research projects
9 for students;
10 (2) establishing a system for students and
11 teachers involved in research projects funded under
12 this section to exchange information about their
13 projects and research results; and
14 (3) assessing the educational value of the stu-
15 dent research projects by such means as tracking
16 the academic performance and choice of academic
17 majors of students conducting research.
18 (f) STIPENDS.—Grants awarded under this section
19 may be used to provide stipends for teachers or students

1 participating in training or research activities that would
2 not be part of their typical classroom activities.

Page 8, after line 5, insert the following new paragraph, and renumber the subsequent paragraphs accordingly:

3 (3) a description of the number, size and nature
4 of any stipends that will be provided to students or
5 teachers and the reasons such stipends are needed;

Page 8, line 12, after "consider" insert ", at a minimum".

Page 13, line 3, after "consider" insert ", at a minimum".

Page 14, after line 16, insert the following new paragraph and renumber the subsequent paragraphs accordingly:

6 (2) contain, to the extent practicable, an Inter-
7 net-based repository of information about national
8 and regional conferences related to the improvement
9 of elementary and secondary mathematics, science,
10 engineering and technology education, including, if
11 appropriate, links to materials generated by those
12 conferences.

1 Page 18, line 18, after "consider" insert ", at a min-
2 imum".

3 Page 19, after line 9, add the following new sub-
4 section:

5 (c) AWARDS.—The Director shall ensure, to the ex-
6 tent practicable, that the Centers funded under this sec-
7 tion conduct research and develop educational practices
8 designed to improve the educational performance of a
9 broad range of students, including those from groups
10 underrepresented in mathematics, science and engineer-
11 ing.

12 Page 22, line 14, after "consider" insert ", at a min-
13 imum".

14 Page 26, line 19, after "consider" insert ", at a min-
15 imum".

Page 33, after line 16, insert the following new section and redesignate the remaining section:

16 **SEC. 410. REPORT.**

17 (a) DATA COLLECTION.—Institutions receiving
18 grants under this title shall supply to the Director any
19 relevant statistical and demographic data on scholarship
20 recipients and stipend recipients the Director may request,

1 including information on employment required by section
2 407.

3 (b) ASSESSMENT.—Not later than 7 years after the
4 date of the enactment of this Act, the Director shall sub-
5 mit to Congress a report assessing the impact of the im-
6 plementation of this title on drawing into teaching top
7 mathematics and science students, including students
8 from groups underrepresented in mathematics, science
9 and engineering.

10 Page 34, line 19, after "**TECHNOLOGIES**" insert
11 "**RESEARCH**".

12 Page 37, line 1, after "consider" insert ", at a min-
13 imum,".

14 Page 37, line 12, strike "affluence" and insert "in-
15 come".

Page 46, after line 11, add the following new sections:

16 **SEC. 704. INSTRUCTIONAL MATERIALS.**

17 The Director may award competitive, merit-reviewed
18 grants for the development of educational materials on en-
19 ergy production and use, energy conservation, and renew-
20 able energy for use in elementary and secondary schools.

1 **SEC. 705. STUDY OF BROADBAND NETWORK ACCESS FOR**
2 **SCHOOLS AND LIBRARIES.**

3 (a) REPORT TO CONGRESS.—The Director shall con-
4 duct a study of the issues described in subsection (c), and
5 not later than 1 year after the date of the enactment of
6 this Act, transmit to Congress a report including rec-
7 ommendations to address those issues. Such report shall
8 be updated annually for 6 additional years.

9 (b) CONSULTATION.—In preparing the reports under
10 subsection (a), the Director shall consult with the National
11 Aeronautics and Space Administration, the National Insti-
12 tute of Standards and Technology, and such other Federal
13 agencies and educational entities as the Director considers
14 appropriate.

15 (c) ISSUES TO BE ADDRESSED.—The reports shall—

16 (1) identify the current status of high-speed,
17 large bandwidth capacity access to all public elemen-
18 tary and secondary schools and libraries in the
19 United States;

20 (2) identify how the provision of high-speed,
21 large bandwidth capacity access to the Internet to
22 such schools and libraries can be effectively utilized
23 within each school and library;

24 (3) consider the effect that specific or regional
25 circumstances may have on the ability of such insti-
26 tutions to acquire high-speed, large bandwidth ca-

1 pacity access to achieve universal connectivity as an
2 effective tool in the education process; and
3 (4) include options and recommendations to ad-
4 dress the challenges and issues identified in the re-
5 ports.

6 **SEC. 706. EDUCATIONAL TECHNOLOGY ASSISTANCE;**
7 **LEARNING COMMUNITY CONSORTIUM.**

8 Section 3 of the Scientific and Advanced Technology
9 Act of 1992 (Public Law 102–476; 42 U.S.C. 1862i) is
10 amended by redesignating subsections (d), (e), and (f) as
11 subsections (f), (g), and (h), respectively, and by inserting
12 after subsection (c) the following new subsections:
13 "(d) EDUCATIONAL TECHNOLOGY ASSISTANCE.—
14 "(1) IN GENERAL.—The Director is authorized
15 to make awards on a competitive, merit-reviewed
16 basis to associate-degree granting colleges, bachelor-
17 degree granting institutions, or education service
18 agencies (or consortia thereof) to establish centers to
19 assist elementary and secondary schools in the use
20 of information technology for mathematics, science,
21 or technology instruction.
22 "(2) ACTIVITIES.—Activities of centers funded
23 under this subsection may include—
24 "(A) helping schools evaluate their need
25 for information technology;

"(B) training teachers on how to best use information technology in instruction; and

"(C) providing other information and training to help schools and teachers ensure that they have access to appropriate information technologies and are using them to maximum advantage.

"(3) APPLICATION.—An application to receive funds under this subsection shall include, at a minimum—

"(A) a description of the services that will be provided to schools and teachers;

"(B) a list of the schools expected to be served;

"(C) a description of how the applicant will draw on the expertise of its faculty and students to assist schools and teachers; and

"(D) a description of how the applicant will operate the program after funding made available by this subsection has expired.

"(4) SELECTION.—In evaluating applications submitted under paragraph (3), the Director shall consider, at a minimum—

"(A) the ability of the applicant to effectively carry out the program;

1 "(B) the number of schools and students
2 who would be served and the their need for as-
3 sistance;
4 "(C) the extent to which the applicant has
5 worked with participating schools to ensure that
6 priority problems would be addressed by the as-
7 sistance provided under this subsection; and
8 "(D) the ability of the applicant to con-
9 tinue to provide assistance after funding under
10 this subsection has expired.
11 "(5) AWARDS.—(A) The Director shall ensure,
12 to the extent practicable, that the program estab-
13 lished by this subsection assists schools in rural,
14 suburban, and urban areas.
15 "(B) No institution shall receive funds under
16 this subsection for more than three years.
17 "(6) REPORT.—Not later than April 1, 2005,
18 the Director shall provide a report to Congress as-
19 sessing the success of the program funded under
20 this subsection and the need of schools for continued
21 assistance, and, based on the experience with the
22 program, recommending ways information tech-
23 nology assistance to schools could be made more
24 broadly available.

1 "(7) AUTHORIZATION OF APPROPRIATIONS.—
2 There are authorized to be appropriated to the Na-
3 tional Science Foundation to carry out this sub-
4 section $5,000,000 for each of the fiscal years 2002
5 through 2004.
6 "(e) LEARNING COMMUNITY CONSORTIUM.—The Di-
7 rector is authorized to provide to a consortium composed
8 of associate-degree granting colleges a grant in the
9 amount of $10,000,000 for the purpose of carrying out
10 a pilot project to encourage women, minorities and persons
11 with disabilities to enter and complete programs in mathe-
12 matics, science, engineering and technology.".

Chairman BOEHLERT. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize myself for a couple of minutes to explain the Amendment. This Amendment, which I am offering with Mr. Hall, reflects a negotiated bipartisan agreement. Let me stress. It reflects a negotiated bipartisan agreement. It includes versions of proposals initially made by Mr. Akin, Mrs. Morella, Mr. Honda, Mr. Matheson, Ms. Jackson Lee, Mr. Larson and Mr. Barcia, as well as some technical changes. Similarly, by the way, the Manager's Amendment at Subcommittee included version of proposals by Mr. Smith of Michigan, Ms. Johnson of Texas and Mr. Hall. I think the sponsors of the various amendments will explain their portions of it, so I won't belabor those items now.

Let me just say that I appreciate the willingness of the minority to negotiate the content of the amendments. And I think the bill is stronger for those provisions being added. The amendments are consistent with the philosophy and structure of the underlying bill and will ensure that all students will benefit from having better teachers and from having and making better use of information technology, thanks to these amendments.

I now recognize Mr. Hall to offer his comments on the bipartisan amendment.

Mr. HALL. Mr. Chairman, thank you. I am pleased to join you in offering this bipartisan amendment to the Markup vehicle for H.R. 1858. The amendment, I might point out, also, includes several new provisions advanced by Mr. Honda, Mr. Matheson and Mrs. Jackson Lee, but I will defer to them, as you have done, for their explanation of their provisions. I want to thank you for working with us in this manner. And I urge your colleagues to support the Manager's Amendment. I yield back my time.

Chairman BOEHLERT. Is there any further discussion? If no, the vote occurs on the amendment. All in favor——

Ms. MORELLA. Mr. Chairman—Mr. Chairman?

Chairman BOEHLERT. All right. Ms. Morella?

Ms. MORELLA. I would love to have an opportunity to thank you and Ranking Member Hall for moving in such a bipartisan manner this important bill.

[Statement of Constance A. Morella:]

OPENING STATEMENT OF HON. CONSTANCE A. MORELLA

Mr. Chairman, I want to personally thank you for pushing this legislation and holding this markup. The future of our educational enterprise is of paramount importance to our continued prosperity. I don't believe that it is an exaggeration to suggest that today's effort will be among the most important work this committee does this session.

Members of this committee are keenly aware of our nation's lackluster performance in the most recent TIMSS, TIMSS–R, and NAEP reports. Perhaps most disturbing, data from the fourth through twelfth grades suggest that our students grow further behind our international counterparts the longer they are in school. In many cases, even our strongest districts lag behind international averages. For example, while I took some pride in learning that Montgomery County soundly beat the national average in both math and science, we still lagged Eastern and European powerhouses. This situation is quite simply unacceptable.

H.R. 1858 and H.R. 100 do a number of things to address these problems. We need to recruit better teachers and provide additional training to the ones we have. Teachers, like most professionals in opportunities for continuous development. Education is not a static discipline; our needs and therefore the requirements of our teachers are constantly changing as technology advances. Our methodologies need to change with them. These bills will provide grants for the development of current

teachers, scholarships for math and science majors who go into teaching, funds to provide master teachers, and other initiatives to improve the quality of our math and science instructors.

In addition, we need to provide opportunities for traditionally underrepresented groups to excel in math and science related fields. Bureau of Labor Statistics tell us that careers in science, engineering, and technology are booming and over the next few years we will need to fill over 5 million new jobs in high-tech specialty occupations. To meet this demand, we will need participation from all sectors of our workforce. Yet, according to a report by the Congressional Commission on the Advancement of Women and Minorities in Science, Engineering, and Technology Development, women, minorities, and persons with disabilities still eschew technical occupations. They are severely underrepresented in scientific disciplines and while they represent the fastest growing segment of the workforce, they are not going into technical careers at an appreciable rate. If we are to meet the future demand for a highly skilled workforce, we must find ways to tap into these groups.

These bills would also address this important issue. They contain programs and language specifically geared towards the recruitment and retention of qualified individuals from these underrepresented groups. I am thrilled that these proposals have been included in this legislation and I thank the Chairman and the Committee for prioritizing the need to strengthen the technology pipeline. Both bills that we are considering today will make great strides in accomplishing this goal.

Ms. MORELLA. As the most recent TIMSS and TIMSS–R and NAEP reports have shown, the quality of the U.S. science and math education continues to lack the results that we expect from American students. Fresh ideas and new approaches are desperately needed. By working together under your leadership, we are able to implement some important reforms.

H.R. 1858 addresses many of the concerns outlined in the Glenn Commission Report entitled, Before It's Too Late. Particularly with regard to teacher preparation. I served on that Glenn Commission. We explored ways for teachers to access professional development programs, to meet the ever-growing needs of our students and our S.E.T. work force. And this bill will establish ways to recruit more science and math professionals into the classroom and to make sure our children's instructors are trained in the specific subject areas they will be teaching, while improving teacher incentives.

I want to thank you, Mr. Chairman and the Committee staff, for working with me to include my amendment in Section 706E, Learning Community Consortium. This grant was developed from recommendations of the Commission on the Advancement of Women, Minorities and Individuals with Disabilities in science, engineering and technology and will enable a consortium of community colleges to establish a pilot project. The report reflects the important role of community colleges in preparing the high-tech employees of the future. When we look at nearly 45 percent of all U.S. undergraduates currently enrolled in community colleges, a majority of whom came from traditionally underrepresented groups in the science, engineering and technology fields—I recall Eileen Collins, even, was a product of community colleges.

As we recognize that diversity in science and math, it is necessary for our future success that these institutions not be left out. Unfortunately, in a competitive world of merit review, these institutions generally are left behind, funds tend to gravitate toward traditional programs and traditional ideas. But our efforts need to be all encompassing and reflect a true diversity of students.

Community colleges generally have strong local ties and a proven history of providing a qualified local work force in communities around the nation and fostering the types of partnerships sought after in this legislation.

So Mr. Chairman, I'm enthusiastically supporting this legislation. I want to thank you, Ranking Member Hall, the Committee, the Staff, for prioritizing the need to strengthen the technology pipeline.

Both bills that we are going to be looking at today are accomplishing that goal and will make great strides. Thank you, Mr. Chairman. I yield back.

Chariman BOEHLERT. Thank you very much, Mrs. Morella. And thank you for the role you have played in your important Subcommittee and you are always there and we appreciate it.

And another one that we appreciate her valuable input is Ms. Woolsey, who was particularly helpful at the Subcommittee level. The Chair now recognizes the distinguished colleague from California.

[Statement of Lynn C. Woolsey follows:]

STATEMENT OF HON. LYNN WOOLSEY

Mr. Chairman, thank you for the time to speak in support of H.R. 1858. And, I'd like to commend you for your efforts in bringing this bill together in a true bipartisan manner. That's the mark of a legislative success and a reason why it's such a pleasure to serve on the Science Committee.

This bill can also be considered a success because it's a strong blueprint to further science education in our country. As a member of both the House Education and Science Committees, I'm quite aware of the challenges that our students and schools face in this area. We also know that having a properly educated workforce in the math and science fields is a major priority of employers across the country, especially in the hi-tech arena.

Mr. Chairman, it's also quite clear that there is no way that America can truly have a technically competent workforce if the majority of our students—females—don't study science, math, engineering, or technology. That's why I'm glad that we were able to work together to ensure that this bill addresses this important issue.

The "Science Enrichment Programs for Girls," which is based on my bill—H.R. 1636 and on H.R. 1693—will authorize N.S.F. to fund programs in elementary and secondary schools that encourage the ongoing interest of girls in science, math, engineering, and technology. It will provide a way for girls to gain both the practical advice and the vision they need to pursue undergraduate, graduate or careers in these fields.

In turn, this will help create a bold new workforce of energized young women. This means that companies will be able to hire the workers they need right here in America, because, the fifty percent of our population which is now turning away from careers in science, math, engineering and technology, will get the education they need to fill those jobs.

This important provision is one reason I encourage my colleagues, on both sides of the aisle, to join me in supporting this bill.

Thank you. I yield back my time.

Ms. WOOLSEY. Thank you, Mr. Chairman. And thank you. I, too, want to support H.R. 1858. And I want to compliment you on your efforts at bringing this bill together in a truly bipartisan manner. That is why I like serving on this Committee so very much. We actually get things done.

This bill can be considered a success because it is a strong, strong blueprint to further scientific education in our country. And as a member of both the House Education and Science Committees, as is Congressman Ehlers, we are very aware of the challenges that our students and schools face in this area of science, math and technology. We also know that having a properly educated workforce in these fields is a major priority of employers across the country. Especially in the high-tech arena.

Mr. Chairman, it is also quite clear that there is no way that America can truly have a technically competent work force if the

majority of our students, females, don't study science, math, engineering and technology. That is why I am glad that we are able to work together to ensure that this bill addresses this important issue.

The Science Enrichment Programs for girls, which is based on my bill, H.R. 1636, and was also in Mr. Hall's bill, H.R. 1693, will authorize National Science Foundation to fund programs in elementary and secondary schools that encourage the ongoing interests of girls in science, math and technology. It will provide a way for girls to gain both the practical advice and the vision they need to pursue undergraduate, graduate or careers in these fields.

In turn, this will help create a bold new work force of energized young women. Which means that companies will be able to hire the workers they need right here in America because the 50 percent of our population which is now turning away from careers in these fields, will get the education they need so that they can, if they choose, fill these jobs.

This important provision is one reason I encourage my colleagues on both sides of the aisle to join me in supporting the bill. But there are many, many other reasons, as well. Thank you.

Chairman BOEHLERT. Thank you very much. Anyone else who seeks recognition?

Mr. BARCIA. Mr. Chairman, this is on the Amendment. Is that correct?

Chariman BOEHLERT. That is correct. The Manager's Amendment. Mr. Barcia.

[Statement of James A. Barcia follows:]

STATEMENT OF HON. JIM BARCIA

Thank you Chairman Boehlert and Ranking Member Hall. I also wish to thank Chairman Boehlert for his willingness to work with me in such a bipartisan manner to craft this portion of the Manager's Amendment.

My provision in this manager's amendment incorporates much of H.R. 1889, the Educational Technology Utilization Extension Assistance Act, a bill I introduced, along with my colleagues David Wu and Mark Udall. This section directs the National Science Foundation to work with the Department of Education to create educational technology extension centers.

The focus of these centers is to advise and assist local K–12 schools to better utilize and integrate their existing educational technology infrastructure into their curriculum and classroom, as well as help schools evaluate their need for new information technologies.

This provision addresses a problem identified by school administrators, independent educational organizations and scores of teachers, that more support resources are needed to maximize the use of technology in the classroom.

Education technology centers will enhance the services provided by those who are currently providing assistance to teachers, like local intermediate school districts. Where this type of technical advice is not available, this legislation would initiate this important effort.

Mr. Chairman, there simply are not enough hours in the day for our teachers to meet the demands placed on them in the classroom and to take the time needed to research all of the new technologies available for their students.

I believe by establishing centers dedicated solely to providing teachers with information and training to effectively utilize available technology, we will allow teachers to provide their students with the resources necessary to equip them for the 21st century.

I urge my colleagues to support the adoption of this manager's amendment.

Mr. BARCIA. Thank you, Chairman Boehlert. I also want to, first of all, thank you for working together with Congressman Ehlers and also Ranking Member Hall. I thank you for your willingness

to work together in a bipartisan manner to craft this portion of the Manager's Amendment.

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I believe by establishing centers dedicated solely to providing teachers with information and training to effectively utilize available technology, we will allow teachers to provide their students with the resources necessary to equip them for the 21st Century.

And I would urge my colleagues to support the adoption of the Manager's Amendment.

Chairman BOEHLERT. Thank you very much. Chair recognizes Mr. Larson.

[Statement of John B. Larson follows:]

STATEMENT OF HON. JOHN B. LARSON

Thank you Mr. Chairman and Members of the Committee.

The United States currently finds itself at the apogee of its wealth, power and influence—a fact that is attributable, in no small part, to unprecedented innovation in the information technology industry. As the former Chairman of the Science Committee, the Gentleman from Wisconsin, Mr. Sensenbrenner, has stated in the past, "maintaining the Nation's global leadership in information technology will require keeping open the pipeline of new ideas, technologies, and innovations * * * unless we act soon to bolster the technological skills of our citizens, we risk losing our leadership."

As access to computers and the ability to use technology effectively are becoming increasingly important for full participation in America's economic, political and social life, it becomes necessary to become ever-more technologically fluent to stay competitive in a globalized, and increasingly digital world.

My part of the Manager's amendment is simple: it allows the National Science Foundation to—as Dr. George Strawn of the NSF, who testified before the Science Committee last year—"[identify the] best educational practices to provide educators and policy makers with tools for using existing and evolving Internet technology more effectively as a part of [the nation's] educational strategy."

My amendment simply adds a new section to Title VII requiring the National Science Foundation to conduct a study—with—subsequent yearly updates—that identifies:

(1) The current status of high-speed, large bandwidth capacity access to all public elementary and secondary schools and libraries in the United States;

(2) How high-speed, large bandwidth capacity access to the Internet to such schools and libraries can be MOST effectively utilized within each school and library; and

(3) The effect that specific or regional circumstances may have on these institutions' ability to acquire high-speed, large bandwidth capacity access to achieve universal connectivity, which has become a crucial tool in the education process.

It is essential that in order to prepare our public schools for the 21st century, we must rethink how our children's education is delivered into the classrooms. This amendment would provide our schools with the best data available from the some of the nation's top researchers to help schools enter the 21st century by establishing the educational pipeline—clearly, broadband—though which we can supply the energy necessary to fuel the new digital economy.

Last year, I offered a similar amendment to H.R. 2086 that was adopted by the House. Unfortunately, H.R. 2086 did not move in the Senate and, therefore, efforts to review the impact of broadband technologies in instructional settings have languished. I believe it is imperative that we not forgo again the opportunity to study how we can best provide our students these critical tools for learning in the 21st century.

Lastly, I want to thank the Chairman, Mr. Boehlert, Mr. Ehlers, Mr. Hall and the rest of the Members of the Committee for their hard work and cooperation in bringing together their ideas into this common-sense bill which, I believe, will go a long way towards accomplishing our Nation's goals of maintaining our leading status in the world.

Thank you Mr. Chairman.

Mr. LARSON. Thank you very much, Mr. Chairman. Let me join in the accolades for the outstanding job you have done in bringing these amendments forward. I would also like to thank Ranking Member Hall and Eddie Bernice Johnson and Mr. Smith and Mr. Ehlers, as well, for their cooperation in truly putting forward a bill that will go a long way towards addressing a number of the concerns the members have on this Committee as it relates to science and mathematics teaching within our public school system.

Also, thank you for including an amendment that I have offered that addresses a very specific issue of broad bandwidth and the ability for our school systems to overcome some of the problems that create the inequities between urban, suburban and rural schools and their connectivity. I thank you again for your leadership and appreciate the opportunity to have participated in this——

Chairman BOEHLERT. Let me point out that we have a reporting quorum here, so I would hope my colleagues would keep their remarks brief. And furthermore, let me say, in response to Mr. Barcia, it is not a willingness of the Chair to work on a bipartisan basis. It is an obligation. And I take that obligation seriously. Mr. Udall.

[Statement of Mark Udall follows:]

STATEMENT OF HON. MARK UDALL

I want to express particular support for Title IV in this bill. Title IV sets up the Robert Noyce Scholarship program, which would provide scholarships and programming designed to recruit and train mathematics and science teachers. As you know, Mr. Chairman, I introduced a similar bill earlier this year, which was incorporated into Mr. Hall's Science Education for the 21st Century Act. I am very glad you've incorporated provisions dealing with scholarships in this package.

Mr. Chairman, I rise in support of this bill. I'd like to recognize my colleagues for their good work in putting together this manager's amendment, and I'd like to recognize you for working with them to include this amendment in your bill. Given its bipartisan support, I am hopeful we'll be able to move this bill quickly through this Committee and through the Congress and to the President for his signature.

Mr. UDALL. Thank you, Mr. Chairman. I, too, want to join my colleagues in thanking the leadership of the Committee under your

able leadership and Ranking Member Hall for bringing this important legislation forward.

In particular, the—I want to express my support for Title IV. Title IV sets up the Robert Noyce Scholarship Program, which would provide scholarships and programming designed to recruit and train mathematics and science teachers. As you know, Mr. Chairman, I introduced a similar bill earlier this year, which was incorporated into Mr. Hall's Science Education for the 21st Century Act. I am very glad you have incorporated provisions dealing with scholarships in this package. Again, thank you, and I yield back my time.

Chairman BOEHLERT. Thank you very much. The Chair recognizes Mr. Smith.

[Statement of Nick Smith follows:]

OPENING STATEMENT OF HON. NICK SMITH

Last week the Subcommittee on Research had the opportunity to markup the two pieces of legislation we'll consider today. I'm pleased to report that we reached broad bipartisan agreement on the substance of the bills and were able to report them unanimously to Full Committee. In opening that markup I noted that both bills address an issue that is at the heart of our national security and prosperity: the math and science education we provide our children. We're in the midst of a technological revolution that has driven our economy, improved our productivity, and helped us live longer, healthier lives—a revolution fueled in large part by our past investment in research and development. But this research and development is, in turn, enabled by the investments we make educating our children in math and science. The two bills we reported take important steps to manage that investment.

I'm also pleased that the bills before us today represent the work and input of many Members from both sides of the Research Subcommittee and the Full Committee. I want to thank the Chairman for his willingness to include provisions important to me and the other Members of the Subcommittee in his bill, H.R. 1858, and particularly for his inclusion of language establishing the Centers on Research on Learning and Education and Education Research Teacher Fellowships that comprise Title III that originally appeared in my Education Research legislation. These provisions address the need to bridge the gap between the basic research on how children learn and actual classroom practice—a gap we've explored in several hearings before the Subcommittee. As some of the witnesses at those hearings testified, the "fire" of interest within children for math and science is likely lit at a young age. We need to do what we can to encourage this "fire starting" in more classrooms nationwide.

I'm pleased to offer my support to the bills today and once again thank Chairman Boehlert and Ranking Member Hall, as well as the Ranking Member of the Research Subcommittee, Ms. Eddie Bernice Johnson, and Rep. Vern Ehlers, the sponsor of H.R. 100, for bringing the bills this far.

Mr. SMITH. I hope all further comments can be limited to 60 seconds and I will try to do that. These bills passed our Subcommittee last week. I said at that time that probably math and science education is the great—is the second greatest threat to national security of this country. Not only in developing greater independence in energy, but energy that defense technology, the economy, in general, and improving our productivity and developing new products.

These two bills are going to move us ahead with hopefully, the beginning of a greater determination to improve math and science education in K through 12. Thank you, Mr. Chairman.

Chairman BOEHLERT. As Mark Negronsky used to say, you have had the last word. And it is a good word. And I thank you very much for the leadership you have demonstrated. We have a call to the House right now. So I would like to proceed, if there are no strenuous objections. Is there any further discussion? If no, the vote occurs on the amendment. All in favor, say aye. Opposed, No.

The ayes have it. The amendment is agreed to. Now, there will be a motion to report the—are there any further amendments? Hearing none, the question is on the bill H.R. 1858, National Mathematics and Science Partnership Act, as amended. All those in favor, say aye. Opposed, no. In the opinion of the Chair, the ayes have it. I will now recognize Mr. Gordon for a motion.

Mr. GORDON. Mr. Chairman, I move the Committee favorably report H.R. 1858 as amended to House with the recommendation that the bill, as amended, do pass.

Furthermore, I move that the staff be instructed to prepare the legislative report and make necessary technical and conforming changes, that the Chairman take all necessary steps to bring the bill before the House for consideration.

Chairman BOEHLERT. The Chair notes the presence of a reporting quorum. The question is now on the motion to report the bill favorably. Those in favor of the motion will signify by saying aye. Opposed, no. The ayes have it. I move that Members have 2 subsequent calendar days in which to submit supplemental, minority or additional views on the measure. I move pursuant to Cause one of Rule 22 of the Rules of the House that the Committee authorized the Chairman to offer such motions as may be necessary in the House to go to conference with the Senate on the bill H.R. 1858 or a similar Senate bill.

○