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HOUSE OF REPRESENTATIVES

REPORT
109–524

SCIENCE AND MATHEMATICS EDUCATION FOR COMPETITIVENESS ACT

JUNE 22, 2006.—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. 5358]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science, to whom was referred the bill (H.R. 5358) to authorize programs relating to science, mathematics, engineering, and technology education at the National Science Foundation and the Department of Energy Office of Science, 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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I. AMENDMENT

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 "Science and Mathematics Education for Competitiveness Act".

SEC. 2. FINDINGS.

Congress finds the following:

(1) The National Science Foundation has made significant and valuable contributions to the improvement of K–12 and undergraduate science, technology, engineering, and mathematics education throughout its 56 year history.

(2) The National Science Foundation shall continue to carry out the functions described in section 3 of the National Science Foundation Act of 1950 (42 U.S.C. 1862).

SEC. 3. ROBERT NOYCE TEACHER SCHOLARSHIP PROGRAM.

Section 10 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n–1) is amended—

(1) by inserting "Teacher" after "Noyce" in the section heading and each place it appears in the text;

(2) in subsection (a)(1)—

(A) by striking "to provide scholarships, stipends, and programming designed"; and

(B) by inserting "and to provide scholarships and stipends to students participating in the program" after "science teachers";

(3) in subsection (a)(3)(A)—

(A) by striking "encourage top college juniors and seniors" and inserting "recruit and prepare undergraduate students"; and

(B) by inserting "qualified as" after "to become";

(4) in subsection (a)(3)(A)(ii)—

(A) by striking "programs to help scholarship recipients" and inserting "academic courses and early field teaching experiences designed to prepare students participating in the program";

(B) by striking "programs that will result in" and inserting "such preparation as is necessary to meet requirements for"; and

(C) by striking "licensing; and" and inserting "licensing;";

(5) in subsection (a)(3)(A)(iii)—

(A) by striking "scholarship recipients" and inserting "students participating in the program";

(B) by striking "enable the recipients" and inserting "enable the students"; and

(C) by striking "; or" and inserting "; and";

(6) in subsection (a)(3)(A) by inserting at the end the following new clause:

"(iv) providing summer internships for freshman and sophomore students participating in the program; or";

(7) in subsection (a)(3)(B)—

(A) by striking "encourage" and inserting "recruit and prepare"; and

(B) by inserting "qualified as" after "to become";

(8) by amending clause (ii) of subsection (a)(3)(B) to read as follows:

"(ii) offering academic courses and field teaching experiences designed to prepare stipend recipients to teach in elementary schools and secondary schools, including such preparation as necessary to meet requirements for teacher certification or licensing;";

(9) in subsection (a) by inserting at the end the following new paragraph:

"(4) ELIGIBILITY REQUIREMENT.—To be eligible for an award under this section, an institution of higher education (or consortia of such institutions) shall ensure that specific faculty members and staff from the institution's mathematics, science, or engineering departments and specific education faculty are designated to carry out the development and implementation of the program. An institution of higher education may also include teacher leaders to participate in developing the pedagogical content of the program and to supervise students participating in the program in their field teaching experiences. No institution of higher education shall be eligible for an award unless faculty from the

institution's mathematics, science, or engineering departments are active participants in the program.";

(10) in subsection (b)(1)(A)—

(A) by striking "scholarship or stipend";

(B) by inserting "and summer internships" after "number of scholarships"; and

(C) by inserting "the type of activities proposed for the recruitment of students to the program," after "intends to award,";

(11) in subsection (b)(1)(B)—

(A) by striking "scholarship or stipend"; and

(B) by striking "; and" and inserting ", which may include a description of any existing programs at the applicant's institution that are targeted to the education of science and mathematics teachers and the number of teachers graduated annually from such programs;";

(12) in subsection (b)(1), by striking subparagraph (C) and inserting the following:

"(C) a description of the academic courses and field teaching experiences required under subsection (a)(3)(A)(ii) and (B)(ii), including—

"(i) a description of the undergraduate program that will enable a student to graduate in 4 years with a major in mathematics, science, or engineering and to obtain teacher certification or licensing;

"(ii) a description of the field teaching experiences proposed; and

"(iii) evidence of agreements between the applicant and the schools or school districts that are identified as the locations at which field teaching experiences will occur;

"(D) a description of the programs required under subsection (a)(3)(A)(iii) and (B)(iii), including activities to assist new teachers in fulfilling their service requirements under this section; and

"(E) an identification of the applicant's mathematics, science, or engineering faculty and its education faculty who will carry out the development and implementation of the program as required under subsection (a)(4).";

(13) in subsection (b)(2)—

(A) by redesignating subparagraphs (B), (C), (D), and (E) as subparagraphs (C), (D), (E) and (F), respectively; and

(B) by inserting after subparagraph (A) a new subparagraph as follows:

"(B) the extent to which the applicant's mathematics, science, or engineering faculty and its education faculty have worked or will work collaboratively to design new or revised curricula that recognizes the specialized pedagogy required to teach mathematics and science effectively in elementary and secondary schools;";

(14) in subsection (c)(3)—

(A) by striking "$7,500" and inserting "$10,000"; and

(B) by striking "of scholarship support" and inserting "of scholarship support, unless the Director establishes a policy by which part-time students may receive additional years of support";

(15) in subsection (c)(4)—

(A) by inserting ", with a maximum service requirement of 4 years" after "was received"; and

(B) by striking "Service required under this paragraph shall be performed in a high-need local educational agency.";

(16) in subsection (c), by adding at the end a new paragraph as follows:

"(5) EXCEPTION.—The period of service obligation under paragraph (4) is reduced by 1 year for scholarship recipients whose service is performed in a high-need local educational agency.";

(17) in subsection (d)(1), by striking "to receive certification or licensing to teach" and inserting "established under subsection (a)(3)(B)";

(18) in subsection (d)(2), by inserting "and professional achievement" after "academic merit";

(19) in subsection (d)(3), by striking "1 year" and inserting "16 months";

(20) in subsection (d)(4), by striking "for each year a stipend was received";

(21) in subsection (g)(2)(A)—

(A) by striking "Treasurer of the United States," and inserting "Treasurer of the United States."; and

(B) by striking "multiplied by 2."

(22) in subsection (i)(3), by inserting "or had a career in" after "is working in"; and

(23) by adding at the end the following:

"(j) SCIENCE AND MATHEMATICS SCHOLARSHIP GIFT FUND.—In accordance with section 11(f) of the National Science Foundation Act of 1950, the Director is author-

ized to accept donations from the private sector to support scholarships, stipends, or internships associated with programs under this section.

"(k) ASSESSMENT OF TEACHER RETENTION.—Not later than 4 years after the date of enactment of this subsection, the Director shall transmit to Congress a report on the effectiveness of the program carried out under this section regarding the retention of participants in the teaching profession beyond the service obligation required under this section.

"(l) AUTHORIZATION OF APPROPRIATIONS.—Except as provided in subsection (m), there are authorized to be appropriated to the Director for the Robert Noyce Teacher Scholarship Program—

"(1) $50,000,000 for fiscal year 2007, of which at least $7,500,000 shall be used for capacity building activities described in subsection (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii);

"(2) $70,000,000 for fiscal year 2008, of which at least $10,500,000 shall be used for capacity building activities described in subsection (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii);

"(3) $90,000,000 for fiscal year 2009, of which at least $13,500,000 shall be used for capacity building activities described in subsection (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii);

"(4) $110,000,000 for fiscal year 2010, of which at least $16,500,000 shall be used for capacity building activities described in subsection (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii); and

"(5) $130,000,000 for fiscal year 2011, of which at least $19,500,000 shall be used for capacity building activities described in subsection (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii).

"(m) EXCEPTION.—For any fiscal year for which the funding allocated for activities under this section is less than $50,000,000, the amount of funding available for capacity building activities described in paragraphs (1) through (5) of subsection (l) shall not exceed 15 percent of the allocated funds.".

SEC. 4. SCHOOL AND UNIVERSITY PARTNERSHIPS FOR SCIENCE AND MATHEMATICS EDUCATION.

(a) IN GENERAL.—Section 9 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n) is amended—

(1) in the section heading by striking "**MATHEMATICS AND SCIENCE EDUCATION PARTNERSHIPS**" and inserting "**SCHOOL AND UNIVERSITY PARTNERSHIPS FOR SCIENCE AND MATHEMATICS EDUCATION**";

(2) in subsection (a)(2)—

(A) by striking "(A)";

(B) by striking subparagraph (B);

(C) by inserting ", through 1 or more of its departments in science, mathematics, or engineering," after "institution of higher education"; and

(D) by striking "a State educational agency" and inserting "education faculty from the participating institution or institutions of higher education, a State educational agency,";

(3) in subsection (a)(3)(B) by—

(A) inserting "content-specific" before "professional development programs";

(B) inserting "which are" before "designed"; and

(C) inserting "and which may include teacher training activities to prepare science and mathematics teachers to teach Advanced Placement and International Baccalaureate science and mathematics courses" after "and science teachers";

(4) in subsection (a)(3)(C) by inserting "and laboratory experiences" after "technology" and by inserting "and laboratory" after "provide technical";

(5) in subsection (a)(3)(E) by striking "master teachers" and inserting "teacher leaders";

(6) in subsection (a)(3)(I) by inserting "including model induction programs for teachers in their first 2 years of teaching," after "and science,";

(7) in subsection (a)(3)(K) by striking "developing and offering mathematics or science enrichment programs for students, including after-school and summer programs;" and inserting "developing educational programs and materials for use in and conducting mathematics or science enrichment programs for students, including after-school programs and summer camps for students described in subsection (b)(2)(G);";

(8) in subsection (a)(4) by striking "master teachers" and inserting "teacher leaders" in the paragraph heading and each place it appears in the text;

(9) in subsection (a) by inserting at the end the following:

"(8) MASTER'S DEGREE PROGRAMS.—Activities carried out in accordance with paragraph (3)(B) shall include the development and offering of master's degree programs for in-service mathematics and science teachers that will strengthen their subject area knowledge and pedagogical skills. Grants provided under this section may be used to develop and implement courses of instruction for the master's degree programs, which may involve online learning, and develop related educational materials.

"(9) MENTORS FOR ADVANCED PLACEMENT COURSES TEACHERS AND STUDENTS.—Partnerships carrying out activities to prepare science and mathematics teachers to teach Advanced Placement and International Baccalaureate science and mathematics courses in accordance with paragraph (3)(B) shall encourage companies employing scientists, mathematicians, or engineers to provide mentors to teachers and students and provide for the coordination of such mentoring activities.

"(10) INVENTIVENESS.—Activities carried out in accordance with paragraph (3)(H) may include the development and dissemination of curriculum tools that will help foster inventiveness and innovation.";

(10) in subsection (b)(2) by redesignating subparagraphs (E) and (F) as subparagraphs (F) and (G), respectively, and inserting after subparagraph (D) the following new subparagraph:

"(E) the extent to which the evaluation described in paragraph (1)(E) will be independent and based on objective measures;";

(11) in subsection (b)(3)(A) by striking "and" at the end;

(12) in subsection (b)(3) by redesignating subparagraph (B) as subparagraph (C) and inserting after subparagraph (A) the following new subparagraph:

"(B) give priority to applications that include teacher training activities as the main focus of the proposal; and";

(13) in subsection (b) by inserting at the end the following:

"(4) MINIMUM AND MAXIMUM GRANT SIZE.—A grant awarded under this section shall be not less than $75,000 or greater than $2,000,000 for any fiscal year.";

(14) in subsection (c)—

(A) by striking paragraph (2);

(B) by redesignating paragraphs (3), (4), and (5) as paragraphs (4), (5), and (6), respectively; and

(C) by inserting after paragraph (1) the following new paragraphs:

"(2) REPORT ON MODEL PROJECTS.—The Director shall determine which completed projects funded through the program under this section should be seen as models to be replicated on a more expansive basis at the State or national levels. Not later than 1 year after the date of enactment of this paragraph, the Director shall transmit a report describing the results of this study to the Committee on Science and the Committee on Education and the Workforce of the House of Representatives and to the Committee on Commerce, Science, and Transportation and the Committee on Health, Education, Labor, and Pensions of the Senate.

"(3) REPORT ON EVALUATIONS.—Not later than 4 years after the date of enactment of this paragraph, the Director shall transmit a report summarizing the evaluations required under subsection (b)(1)(E) of grants received under this program and describing any changes to the program recommended as a result of these evaluations to the Committee on Science and the Committee on Education and the Workforce of the House of Representatives and to the Committee on Commerce, Science, and Transportation and the Committee on Health, Education, Labor, and Pensions of the Senate. Such report shall be made widely available to the public."; and

(15) by adding at the end the following new subsection:

"(d) DEFINITION.—In this section, the term 'mathematics and science teacher' means a mathematics, science, or technology teacher at the elementary school or secondary school level.".

(b) DEFINITIONS.—Section 4 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n note) is amended—

(1) by amending paragraph (6) to read as follows:

"(6) ELIGIBLE NONPROFIT ORGANIZATION.—The term 'eligible nonprofit organization' means a nonprofit organization, such as a museum or science center, involved in the preparation, training, or certification of science and mathematics teachers.";

(2) by amending paragraph (8) to read as follows:

"(8) HIGH-NEED LOCAL EDUCATIONAL AGENCY.—The term 'high-need local educational agency' means a local educational agency that—

"(A) is receiving grants under title I of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 6301 et seq) as a result of having within its jurisdiction concentrations of children from low income families; and

"(B) is experiencing a shortage of highly qualified teachers, as defined in section 9101 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 7801), in the fields of science, mathematics, or engineering."; and

(3) in paragraph (11) by striking "master teacher" and inserting "teacher leader" in the paragraph heading and in the text, and by striking "master teachers" and inserting "teacher leaders" .

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Director of the National Science Foundation for the School and University Partnerships for Science and Mathematics Education program—

(1) $63,000,000 for fiscal year 2007;
(2) $73,000,000 for fiscal year 2008;
(3) $83,000,000 for fiscal year 2009;
(4) $93,000,000 for fiscal year 2010; and
(5) $103,000,000 for fiscal year 2011.

SEC. 5. SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS TALENT EXPANSION PROGRAM.

(a) AMENDMENTS.—Section 8(7) of the National Science Foundation Authorization Act of 2002 is amended—

(1) in subparagraph (A) by striking "competitive, merit-based" and all that follows through "in recent years" and inserting "competitive, merit-reviewed multiyear grants for eligible applicants to improve undergraduate education in science, mathematics, engineering and technology through—

"(i) the creation of programs to increase the number of students studying toward and completing associate's or bachelor's degrees in science, mathematics, engineering and technology, particularly in fields that have faced declining enrollment in recent years; and

"(ii) the creation of centers to develop undergraduate curriculum, teaching methods for undergraduate courses, and methods to better train professors and teaching assistants who teach undergraduate courses to increase the number of students completing undergraduate courses in science, mathematics, technology, and engineering, including the number of nonmajors, and to improve student academic achievement in those courses.

Grants made under clause (ii) shall be awarded jointly through the Education and Human Resources Directorate and at least 1 research directorate of the Foundation";

(2) in subparagraph (B) by striking "under this paragraph" and inserting "under subparagraph (A)(i)";

(3) in subparagraph (C)—

(A) by inserting "(i)" before "The types of";

(B) by redesignating clauses (i) through (vi) as subclauses (I) through (VI), respectively;

(C) by striking "under this paragraph" and inserting "under subparagraph (A)(i)"; and

(D) by adding at the end the following new clause:

"(ii) The types of activities the Foundation may support under subparagraph (A)(ii) include—

"(I) creating model curricula and laboratory programs;

"(II) developing and demonstrating research-based instructional methods and technologies;

"(III) developing methods to train graduate students and faculty to be more effective teachers of undergraduates;

"(IV) conducting programs to disseminate curricula, instructional methods, or training methods to faculty at the grantee institutions and at other institutions;

"(V) conducting assessments of the effectiveness of the Center at accomplishing the goals described in subparagraph (A)(ii); and

"(VI) conducting any other activities the Director determines will accomplish the goals described in subparagraph (A)(ii).";

(4) in subparagraph (D)(i), by striking "under this paragraph" and inserting "under subparagraph (A)(i)";

(5) in subparagraph (D)(ii), by striking "under this paragraph" and inserting "under subparagraph (A)(i)";

(6) after subparagraph (D)(iii), by adding the following new clause:

"(iv) A grant under subparagraph (A)(ii) shall be awarded for 5 years, and the Director may extend such a grant for up to 2 additional 3 year periods.";

(7) in subparagraph (E), by striking "under this paragraph" both places it appears and inserting "under subparagraph (A)(i)";

(8) by redesignating subparagraph (F) as subparagraph (J); and

(9) by inserting after subparagraph (E) the following new subparagraphs:

"(F) Grants awarded under subparagraph (A)(ii) shall be carried out by a department or departments of science, mathematics, or engineering at institutions of higher education (or a consortia thereof), which may partner with education faculty. Applications for awards under subparagraph (A)(ii) shall be submitted to the Director at such time, in such manner, and containing such information as the Director may require. At a minimum, the application shall include—

"(i) a description of the activities to be carried out by the Center;

"(ii) a plan for disseminating programs related to the activities carried out by the Center to faculty at the grantee institution and at other institutions;

"(iii) an estimate of the number of faculty, graduate students (if any), and undergraduate students who will be affected by the activities carried out by the Center; and

"(iv) a plan for assessing the effectiveness of the Center at accomplishing the goals described in subparagraph (A)(ii).

"(G) in evaluating the applications submitted under subparagraph (F), the Director shall consider, at a minimum—

"(i) the ability of the applicant to effectively carry out the proposed activities, including the dissemination activities described in subparagraph (C)(ii)(IV); and

"(ii) the extent to which the faculty, staff, and administrators of the applicant institution are committed to improving undergraduate science, mathematics, and engineering education.

"(H) In awarding grants under subparagraph (A)(ii), the Director shall endeavor to ensure that a wide variety of science, mathematics, and engineering fields and types of institutions of higher education, including 2-year colleges, are covered, and that—

"(i) at least 1 Center is housed at a Doctoral/Research University as defined by the Carnegie Foundation for the Advancement of Teaching; and

"(ii) at least 1 Center is focused on improving undergraduate education in an interdisciplinary area.

"(I) The Director shall convene an annual meeting of the awardees under this paragraph to foster collaboration and to disseminate the results of the Centers and the other activities funded under this paragraph.".

(b) REPORT ON DATA COLLECTION.—Not later than 180 days after the date of enactment of this Act, the Director shall transmit to Congress a report on how the Director is determining whether current grant recipients in the Science, Technology, Engineering, and Mathematics Talent Expansion Program are making satisfactory progress as required by section 8(7)(D)(ii) of the National Science Foundation Authorization Act of 2002 and what funding actions have been taken as a result of the Director's determinations.

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Director of the National Science Foundation for the program described in section 8(7) of the National Science Foundation Authorization Act of 2002—

(1) $44,000,000 for fiscal year 2007, of which $4,000,000 shall be for the grants described in subparagraph (A)(ii);

(2) $55,000,000 for fiscal year 2008, of which $10,000,000 shall be for the grants described in subparagraph (A)(ii);

(3) $60,000,000 for fiscal year 2009, of which $10,000,000 shall be for the grants described in subparagraph (A)(ii);

(4) $60,000,000 for fiscal year 2010, of which $10,000,000 shall be for the grants described in subparagraph (A)(ii); and

(5) $60,000,000 for fiscal year 2011, of which $10,000,000 shall be for the grants described in subparagraph (A)(ii).

SEC. 6. INTEGRATIVE GRADUATE EDUCATION AND RESEARCH TRAINEESHIP PROGRAM.

(a) FUNDING.—For each of the fiscal years 2007 through 2011, the Director of the National Science Foundation shall allocate at least 1.5 percent of funds appropriated for Research and Related Activities to the Integrative Graduate Education and Research Traineeship program.

(b) COORDINATION.—The Director shall coordinate with Federal departments and agencies, as appropriate, to expand the interdisciplinary nature of the Integrative Graduate Education and Research Traineeship program.

(c) AUTHORITY TO ACCEPT FUNDS FROM OTHER AGENCIES.—The Director is authorized to accept funds from other Federal departments and agencies to carry out the Integrative Graduate Education and Research Traineeship program.

SEC. 7. CENTERS FOR RESEARCH ON LEARNING AND EDUCATION IMPROVEMENT.

The Director of the National Science Foundation shall continue to carry out the program of Centers for Research on Learning and Education Improvement as established in section 11 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n–2).

SEC. 8. UNDERGRADUATE EDUCATION PROGRAMS.

The Director of the National Science Foundation shall continue to carry out programs in undergraduate education, including those authorized in section 17 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n–6). Funding for these programs shall increase as funding for the National Science Foundation grows.

SEC. 9. EVALUATION OF PROFESSIONAL SCIENCE MASTERS.

Not earlier than 1 year after the date of enactment of this Act, the Director of the National Science Foundation shall enter into an agreement with an appropriate party to assess the impact of the Professional Science Master's (PSM) degree at a variety of institutions, including the extent to which the degree is interdisciplinary and targeted to emerging fields, such as services sciences, the ability of graduates to obtain employment in industry relative to those who receive traditional science master's degrees, salary ranges for graduates relative to traditional science masters graduates, the extent to which the degree is terminal or graduates go on to continue their education, and the success of the degree in attracting traditionally underrepresented populations, including women and minorities. The results of such study, together with any recommendations for Federal support for Professional Science Master's programs, shall be transmitted to the Congress not later than 3 years after the date of enactment of this Act.

SEC. 10. REPORT ON BROADER IMPACTS CRITERION.

Not later than 1 year after the date of enactment of this Act, the Director of the National Science Foundation shall transmit to Congress a report on the impact of the broader impacts grant criterion used by the National Science Foundation. The report shall——

(1) identify the criteria that each division and directorate of the Foundation uses to evaluate the broader impacts aspects of research proposals;

(2) provide a breakdown of the types of activities by division that awardees have proposed to carry out to meet the broader impacts criterion;

(3) provide any evaluations performed by the National Science Foundation to assess the degree to which the broader impacts aspects of research proposals were carried out and how effective they have been at meeting the goals described in the research proposals;

(4) describe what national goals, such as improving undergraduate science, mathematics, and engineering education, improving K–12 science and mathematics education, promoting university-industry collaboration and technology transfer, and broadening participation of underrepresented groups, the broader impacts criterion is best suited to promote; and

(5) describe what steps the National Science Foundation is taking and should take to use the broader impacts criterion to improve undergraduate science, mathematics, and engineering education.

SEC. 11. STUDY ON LABORATORY EQUIPMENT DONATIONS FOR SCHOOLS.

Not later than 2 years after the date of enactment of this Act, the Director of the National Science Foundation shall transmit a report to the Congress examining the extent to which institutions of higher education are donating used laboratory equipment to elementary and secondary schools. The Director, in consultation with the Secretary of Education, shall survey institutions of higher education to determine—

(1) how often, how much, and what type of equipment is donated;

(2) what criteria or guidelines the institutions are using to determine what types of equipment can be donated, what condition the equipment should be in, and which schools receive the equipment;

(3) whether the institutions provide any support to, or follow-up with the schools; and

(4) how appropriate donations can be encouraged.

SEC. 12. ASSESSMENTS OF NATIONAL SCIENCE FOUNDATION EDUCATION PROGRAMS.

In conducting assessments of National Science Foundation education programs, the Director shall use assessment methods that allow Foundation programs to be compared to education programs supported by other Federal agencies.

SEC. 13. EDUCATION PROGRAMS AT THE DEPARTMENT OF ENERGY.

(a) AUTHORIZATION OF EDUCATION PROGRAMS.—The Secretary of Energy, acting through the Office of Science, shall carry out education programs and activities in fields related to the Office of Science's mission, which may include awarding scholarships or fellowships for study and research, providing research experiences at National Laboratories for undergraduates, and operating summer institutes to improve the content knowledge of science and mathematics teachers.

(b) INVENTORY AND EVALUATION.—

(1) REPORT.—Not later than 1 year after the date of enactment of this Act, the Secretary of Energy shall transmit a report to the Congress which shall contain—

(A) an inventory of existing education programs and activities at the Department and at the National Laboratories, which shall include a description of each education program or activity supported by the Department or the National Laboratories, a description of the intended beneficiaries, and the amount of Federal funding used to support it; and

(B) a schedule for conducting independent evaluations of the education programs and activities identified under subparagraph (A) to assess the impact of such programs and activities on the intended beneficiaries and the larger mission of the Office of Science that shall result in all evaluations of the programs being completed not later than 4 years after the date of enactment of this Act.

(2) IMPLEMENTATION OF SCHEDULE.—The Secretary shall implement the schedule provided under paragraph (1)(B) and shall transmit each evaluation to the Congress as it is completed, along with a description of any actions the Secretary intends to take as a result of the evaluation.

(c) NATIONAL LABORATORIES.—The Secretary shall include the conduct of education programs at the National Laboratories and the results of any evaluations of such programs as a factor in the annual setting of the performance and other incentive fees for a National Laboratories management and operations contractor.

SEC. 14. DEFINITIONS.

In this Act—

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

(2) the term "National Laboratory" has the meaning given the term "nonmilitary energy laboratory" in section 903(3) of the Energy Policy Act of 2005 (42 U.S.C. 16182(3)).

II. PURPOSE OF THE BILL

The purpose of the bill is to strengthen and extend existing federal programs to improve U.S. science, mathematics, engineering, and technology education at all levels through developing and providing teacher training; attracting science, mathematics, and engineering majors to teaching; improving undergraduate science, mathematics, and engineering courses; and expanding interdisciplinary graduate work. The programs authorized in this bill are run by the National Science Foundation (NSF) and the Department of Energy (DOE).

III. BACKGROUND AND NEED FOR THE LEGISLATION

SCIENCE, MATHEMATICS, ENGINEERING, AND TECHNOLOGY EDUCATION IN THE U.S.

Over the past several years, a number of industry and policy organizations have released reports describing the critical role that science and technology play in U.S. economic competitiveness and recommending strengthening science, technology, engineering, and

mathematics (STEM) education at all levels—K–12, undergraduate, and graduate—to ensure that the U.S. has a technologically literate workforce for the 21st century. These recommendations have come from a wide variety of business and academic groups, as well as federal advisory panels; recent reports have been produced by the National Academy of Sciences (NAS), the Council on Competitiveness, the Association of American Universities (AAU), the President's Council of Advisors on Science and Technology, AeA (formerly the American Electronics Association), Business Roundtable, the Electronic Industries Alliance, the National Association of Manufacturers, and TechNet.

K–12 SCIENCE AND MATHEMATICS EDUCATION IN THE U.S.

Without strong science and mathematics education at the K–12 level, efforts to increase the number of Americans training for, and choosing careers in STEM fields will be severely handicapped. Many of the reports focused their recommendations on enhancing teacher training, for both pre-service and in-service teachers. The NAS, in Rising Above the Gathering Storm, recommended attracting new science and mathematics teachers through the use of scholarships and bolstering the skills of the existing science and mathematics teaching corps through extensive professional development opportunities. AAU, in its National Defense Education and Innovation Initiative, emphasized the value of universities partnering with schools to provide teacher training and the need to develop training programs with a good balance between preparation in how to teach and preparation in the content area to be taught.

UNDERGRADUATE AND GRADUATE STEM EDUCATION IN THE U.S.

Once students reach college and graduate school, even well prepared students are choosing not to major in, or are dropping out of STEM fields. Half of all students who begin in the physical or biological sciences and 60 percent of those in mathematics will drop out of these fields by their senior year, compared with the 30 percent drop out rate in the humanities and social sciences. The attrition rates are even higher for underrepresented minorities. In research for their book, Talking About Leaving: Why Undergraduates Leave the Sciences, the authors determined that the most common reasons offered for switching out of a science major included a lack or loss of interest in science, belief that another major was more interesting or offered a better education, poor science teaching, and an overwhelming curriculum. To increase the number of undergraduate students in STEM fields will require not only recruiting more students but also improving the quality of their education.

In Rising Above The Gathering Storm, the NAS recommended expanding the scholarships and fellowships available to attract more U.S. students to STEM fields. Similarly, the Business Roundtable and other industry groups have recommended creating scholarships and loan forgiveness programs for students who pursue degrees in STEM fields and emphasize the need to improve recruitment and retention of STEM majors at undergraduate institutions. AAU called for strengthening the connection between research faculty and undergraduate students at universities, including expand-

ing research opportunities to better engage students in STEM fields.

At the graduate level, the emphasis in many reports is on ensuring that there is a sufficient quantity of students studying STEM fields in preparation for research and technical careers and that the type of graduate education that these students receive is appropriate preparation for research in emerging fields and careers in industry, academia, and government laboratories. In particular, AAU recommended broadening the scope of graduate education, including in interdisciplinary fields.

IV. Summary of Hearings

On Thursday, July 21, 2005, the Committee on Science held a hearing to examine the relationship between federal science and engineering research and education investments and U.S. economic competitiveness. The witnesses were Mr. Nicholas Donofrio, Executive Vice President for Innovation and Technology at IBM Corporation; Mr. John Morgridge, Chairman of Cisco Systems, Incorporated, and part-time professor at Stanford University's Graduate School of Business; and Dr. William Brody, President of The Johns Hopkins University and co-chair of the Council on Competitiveness National Innovation Initiative. The witnesses emphasized that the educational system needed to provide students with a solid background science and engineering fields so that the U.S. has access to a technologically-literate workforce.

On Thursday, October 20, 2005, the Committee on Science held a hearing to receive testimony on the report released by NAS on October 12 entitled Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future. The witnesses were Mr. Norman R. Augustine, retired Chairman and CEO of the Lockheed Martin Corporation (Mr. Augustine chaired the NAS committee that wrote the report); Dr. P. Roy Vagelos, retired Chairman and CEO of Merck & Co. (Dr. Vagelos served on the NAS committee that wrote the report), and Dr. William A. Wulf, President of the National Academy of Engineering. The witnesses emphasized that solving the problems of global economic competition requires significant improvements in America's K–12 and higher education systems and that the U.S. ability to innovate depends on an educated workforce and a social climate that encourages students to pursue science and technology degrees.

On Wednesday, March 15, 2006, the Research Subcommittee of the Committee on Science of the House of Representatives held a hearing to review undergraduate science, mathematics, and engineering education. Dr. Carl Wieman, distinguished professor of physics at the University of Colorado and Nobel Laureate in physics, emphasized the connection between high quality undergraduate instruction in science and mathematics and improvements in K–12 science and mathematics education. Dr. Elaine Seymour, the author of Talking About Leaving: Why Undergraduates Leave the Sciences, described the impact of poor science teaching at the undergraduate level. Dr. Daniel Goroff, Vice President and Dean of Faculty of Harvey Mudd College, Dr. John Burris, President of Beloit College, and Ms. Margaret Collins, Assistant Dean of Science, Business & Computer Technologies at Moraine Valley Community College, concurred with Dr. Wieman's and Dr. Seymour's remarks.

They added that NSF support of undergraduate programs, including research programs for improving professors' quality of teaching, is essential to the enhancement of science and mathematics instruction at that level.

On Thursday, March 30, 2006, the Committee on Science of the House of Representatives held a hearing to consider the role of Federal agencies in K–12 science and mathematics education. The hearing brought together five federal agencies to discuss their work in science and mathematics education at the K–12 level. Secretary of Education Margaret Spellings argued that improving science and mathematics education is essential to maintaining America's global economic competitiveness, and said increased coordination among the agencies would improve federal education programs. NSF Director Arden Bement detailed NSF's expertise in the area of science and mathematics education in particular, noting that the competitive grant process and rigorous evaluations result in excellent programs that bolster science and mathematics education at all levels. Representatives from DOE, the National Aeronautics and Space Administration, and the National Oceanographic and Atmospheric Administration also discussed their own agencies' programs, including opportunities for students and teachers to improve their knowledge science content.

On Wednesday, May 3, 2006, the Committee on Science of the House of Representatives held a hearing to consider the role of the NSF in K–12 science and mathematics education. The hearing further explored the work of the NSF discussed in the March 30 hearing from the points of view of education researchers and teachers. Dr. Dennis Bartels, Executive Director of the Exploratorium science museum in San Francisco, noted the essential role NSF plays in bridging the gap between educational research and usable classroom tools. Dr. Joe Heppert, Chair of the American Chemical Society Committee on Education, agreed and pointed out that NSF's strongest education programs are those that support teacher development through scholarships and training programs. Two teachers, Ms. Judy Snyder, mathematics teacher at Eastside High School in South Carolina and Ms. Becky Pringle, National Education Association Executive Board member and physical science teacher at Susquehanna Middle School in Pennsylvania, also testified that their participation in NSF education programs improved both their understanding of content and their teaching strategies. The witnesses all strongly supported NSF leadership in federal science and mathematics education programs.

V. Committee Actions

On May 11, 2006, Representative John J.H. "Joe" Schwarz; Representative Sherwood Boehlert, Chairman of the Committee on Science; Representative Lamar S. Smith; Representative Ken Calvert, Chairman of the Space Subcommittee; Representative Vernon J. Ehlers, Chairman of the Environment, Technology, and Standards Subcommittee; Representative Judy Biggert, Chairman of the Energy Subcommittee; Representative Bob Inglis, Chairman of the Research Subcommittee; and Representative Michael T. McCaul introduced H.R. 5358, the Science and Mathematics Education for Competitiveness Act, a bill to reauthorize programs relating to

STEM education at NSF and the DOE Office of Science, and for other purposes.

The Full Committee on Science met on Wednesday, June 7, 2006, to consider the bill.

• Mr. Schwarz, Mr. Boehlert, Mr. Gordon, and Ms. Hooley offered an amendment in the nature of a substitute to provide more specifics on the program element of the Robert Noyce Teacher Scholarship Program; expand allowable activities and prioritize teacher training in Student and University Partnerships for Science and Mathematics Education; integrate the centers on undergraduate science, mathematics, and engineering education into the Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP); and add sections on a study of university donation of laboratory equipment and on NSF assessment of education programs. The amendment was adopted by a voice vote.

• Ms. Matsui offered an amendment to gather information on whether participants in the Noyce Program continued in the teaching profession after their service requirement was completed. The amendment was adopted by a voice vote.

• Ms. Johnson offered an amendment to add a new section to the bill to establish a program at NSF to give grants to high-need local educational agencies to purchase lab equipment. A unanimous consent request to withdraw the amendment was agreed to.

Mr. Gordon moved that the Committee favorably report the bill, H.R. 5358, to the House with the recommendation that the bill do pass, and that the staff be instructed to make technical and conforming changes to the bill and prepare the legislative report and that the Chairman take all necessary steps to bring the bill before the House for consideration. With a quorum present, the motion was agreed to by a voice vote.

VI. Summary of Major Provisions of the Bill as Reported

• Strengthens and extends the Noyce Program at NSF by amending the National Science Foundation Authorization Act of 2002. (The Noyce Program provides funding to institutions of higher education to develop and implement programs that prepare STEM majors to become teachers as well as to provide scholarships to such students in exchange for teaching service after graduation.) Specifies some of the programs grantees must provide to prepare students for teaching, including providing field teaching experience.

• Strengthens and focuses the Math and Science Partnership Program at NSF by amending the National Science Foundation Authorization Act of 2002. Renames the program as the "School and University Partnership for Science and Mathematics Education Program." Requires the Director of NSF to give priority to applications that include teacher training activities as the main focus of the proposal. Establishes a minimum grant size of $75,000 per year and a maximum grant size of $2,000,000 per year. Requires the Director to transmit a report to Congress on which completed Math and Science Partnerships projects should be seen as models to be replicated on a more expansive basis at the State or national levels.

• Extends the authorization of, and expands NSF's STEP, which provides grants to colleges and universities to improve undergraduate science, mathematics, and engineering education, by amending the National Science Foundation Authorization Act of

2002. Enables NSF to fund the creation of centers at colleges and universities to develop new approaches to undergraduate education programs, and expands STEP beyond its initial focus of increasing the number of graduating STEM majors to include increasing the number of non-majors taking STEM courses.

• Ensures that funding increases proportionally to the overall NSF budget for the Integrative Graduate Education and Research Traineeship (IGERT), which supports graduate programs and students in interdisciplinary fields.

• Requires NSF to continue the programs on Centers for Research on Learning and Education Improvement and on undergraduate education as authorized in the National Science Foundation Authorization Act of 2002.

• Requires the Director of NSF to arrange for an assessment of the impact of Professional Science Master's degree programs, to evaluate the NSF broader impact grant evaluation criterion, and to conduct a study on university donation of used laboratory equipment to schools. Requires NSF to use assessment methods that allow NSF programs to be compared to education programs supported by other Federal agencies.

• Authorizes the DOE Office of Science to conduct education programs, and requires DOE to inventory and evaluate its current and future education programs.

VII. Section-by-Section Analysis (by Title and Section), as Reported

SEC. 1. SHORT TITLE

"Science and Mathematics Education for Competitiveness Act"

SEC. 2. FINDINGS

Finds that NSF has made significant and valuable contributions to the improvement of K–12 and undergraduate STEM education and that it should continue to carry out education programs.

SEC. 3. ROBERT NOYCE TEACHER SCHOLARSHIP PROGRAM

Amends Section 10 of The National Science Foundation Authorization Act of 2002, which established the Noyce Program. Under the Noyce Program, NSF provides grants to institutions of higher education to encourage top STEM majors to become teachers. The grants are used both to develop programs to prepare students for teaching and to provide to students who commit to teach for two years at the elementary or secondary school level in return for each year of scholarship aid. H.R. 5358 amends the law by specifying some of the programs grantees must provide to prepare students for teaching, including providing field teaching experience, and by making those programs available to students beginning in their freshman year (even though the scholarships are still available only to juniors and seniors, summer internships may be provided to freshmen and sophomores participating in the program). Also amends the law to specify that both faculty from STEM departments and education faculty must be involved in the program. Also amends the law to increase the minimum scholarship from $7,500 per year to $10,000; to allow additional years of scholarship support for part-time students; to cap the post-graduation service re-

requirement at four years; to extend stipend support for professionals in STEM fields returning to schools for a teaching degree to 16 months from one year to align the support with the length of a typical program; and to allow the Director of NSF to accept donations from the private sector to support scholarships, stipends, or internships associated with this program. Also amends the law to allow teaching service to occur in any local educational agency (rather than only in high-need areas), but to reduce the period of service obligation by one year for those scholarship recipients whose service is performed in a high-need local educational agency. Requires NSF, four years after the date of enactment, to transmit to Congress a report on whether participants in the program continue to teach after their service obligation is completed. Authorizes appropriations for the program of $50,000,000 for fiscal year 2007, $70,000,000 for fiscal year 2008, $90,000,000 for fiscal year 2009, $110,000,000 for fiscal year 2010, and $130,000,000 for fiscal year 2011, and sets aside specific portions of those authorizations for the programmatic (as opposed to scholarship) portions of the Noyce Program.

SEC. 4. SCHOOL AND UNIVERSITY PARTNERSHIPS FOR SCIENCE AND MATHEMATICS EDUCATION

Amends Section 9 of The National Science Foundation Authorization Act of 2002, to strengthen the Math and Science Partnerships program at NSF, which provides grants to institutions of higher education (or to eligible nonprofit organizations) to partner with local educational agencies to improve elementary and secondary mathematics and science instruction. Amends the law to clarify that faculty from STEM departments must be the lead participants from the institutions of higher education and clarify that education faculty may participate in the Partnerships. Amends the law to explicitly include as allowable activities developing model induction programs and conducting training to teach Advanced Placement and International Baccalaureate (AP/IB) science and mathematics courses, encouraging STEM professionals to act as mentors for AP/IB students and teachers, and providing science enrichment programs, including after-school programs and summer camps for female and minority students. Also amends the law to explicitly allow teacher training activities to include the development and offering of master's degree programs for in-service mathematics and science teachers that will strengthen their subject area knowledge and pedagogical skills. Amends the law to require the Director of NSF to give priority to applications that include teacher training activities as the main focus of the proposal and to establish that the grant size should be between $75,000 and $2,000,000 per year. Amends the law to require the Director, within a year of the enactment of the Act, to transmit a report to Congress on which completed Math and Science Partnerships projects should be seen as models to be replicated on a more expansive basis at the State or national levels, and, within four years, to transmit a report to Congress summarizing the evaluations each Partnership is required to conduct of its projects and describing any changes to the overall program recommended as a result of these evaluations. Authorizes appropriations for the program of $63,000,000 for fiscal year 2007, $73,000,000 for fiscal year 2008, $83,000,000 for fiscal year 2009,

$93,000,000 for fiscal year 2010, and $103,000,000 for fiscal year 2011.

SEC. 5. SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS TALENT EXPANSION PROGRAM

Amends Section 8(7) of The National Science Foundation Authorization Act of 2002, which established at NSF STEP, which provides grants to institutions of higher education to improve undergraduate education. Amends the law to authorize NSF, as part of STEP, to award grants on a competitive, merit-reviewed basis to institutions of higher education to create Centers to improve undergraduate education through the development and dissemination of undergraduate curriculum and teaching methods, and the development and dissemination of training programs for faculty and graduate students who teach undergraduates. Requires that grants for Centers be made jointly through the NSF Education and Human Resources Directorate and at least one research directorate for periods up to five years, with two possible extensions of no more than three years each. Also requires the Director of NSF, within 180 days, to transmit to Congress a report on how the Director is determining whether current STEP grant recipients are making satisfactory progress toward targets they have set for increasing the number of STEM majors at their institutions and what actions the Director has taken to ensure that funding is continued only to those making satisfactory progress. Authorizes appropriations for STEP of $44,000,000 for fiscal year 2007, of which $4,000,000 shall be for the Centers authorized by this Act; $55,000,000 for fiscal year 2008, of which $10,000,000 shall be for the Centers; $60,000,000 for each of the fiscal years 2009 through 2011, of which $10,000,000 each year shall be for the Centers.

SEC. 6. INTEGRATIVE GRADUATE EDUCATION AND RESEARCH TRAINEESHIP PROGRAM

Requires that the Director of NSF allocate at least 1.5 percent of funds appropriated for Research and Related Activities to the IGERT Program. Requires that the Director coordinate with Federal agencies to expand the interdisciplinary nature of the program, and allows the Director to accept funds from those agencies to carry out the program. (The IGERT program awards grants to institutions of higher education to develop interdisciplinary graduate programs and to provide tuition and stipends for graduate students in those programs.)

SEC. 7. CENTERS FOR RESEARCH ON LEARNING AND EDUCATION IMPROVEMENT

Requires the Director of NSF to continue the program on Centers for Research on Learning and Education Improvement as established in section 11 of the National Science Foundation Authorization Act of 2002.

SEC. 8. UNDERGRADUATE EDUCATION PROGRAMS

Requires the Director of NSF to continue to carry out programs in undergraduate education, including those authorized in section 17 of the National Science Foundation Authorization Act of 2002.

Funding for these programs shall increase as funding for NSF grows.

SEC. 9. EVALUATION OF PROFESSIONAL SCIENCE MASTERS

Requires the Director of NSF to arrange for an assessment of the impact of Professional Science Master's degree programs at a variety of institutions. Requires that the report be submitted to Congress within three years of the enactment of this Act and include information on the interdisciplinary nature of the degree, the employment and salary prospects of degree recipients compared with those of traditional science master's graduates, the extent to which Professional Science Master's graduates continue their education, and the effectiveness of the degree at attracting populations traditionally underrepresented in STEM fields. (Professional Science Master's degree programs consist of two years of training in an emerging or interdisciplinary technological area. Many include internships and training in business and communications.)

SEC. 10. REPORT ON BROADER IMPACTS CRITERION

Requires the Director of NSF to submit to Congress within one year of the enactment of this Act a report that evaluates the results of the use of the broader impacts criterion by NSF. (NSF grant proposals are evaluated for their "intellectual merit" and "broader impact," which includes the benefits of the activity to society at large.) Requires the report to identify how NSF evaluates proposals based on the broader impacts criterion, to categorize the types of broader impacts enumerated by grant applicants, to include any evaluations performed by NSF of the implementation of broader impacts aspects of research proposals, to describe which overarching national goals the broader impacts criterion is best suited to promote, and to describe what steps NSF should take to use the broader impacts criterion to improve undergraduate science, mathematics, and engineering education.

SEC. 11. STUDY ON LABORATORY EQUIPMENT DONATIONS FOR SCHOOLS

Requires the Director of NSF, within one year of the enactment of this Act, to transmit to Congress a report on the extent to which universities are donating used laboratory equipment to elementary and secondary schools and how appropriate donations can be encouraged.

SEC. 12. ASSESSMENTS OF NATIONAL SCIENCE FOUNDATION EDUCATION PROGRAMS

Requires the Director of NSF, in conducting assessments of NSF education programs, to use assessment methods that allow NSF programs to be compared to education programs supported by other Federal agencies.

SEC. 13. EDUCATION PROGRAMS AT THE DEPARTMENT OF ENERGY

Authorizes education programs at DOE, through the Office of Science, in fields related to the Office's mission, including activities such as offering scholarships or fellowships for study or research, research experiences for undergraduates, and summer institutes for improving teacher content knowledge in science and mathe-

matics. Requires the Secretary of Energy to submit a report not later than one year after the enactment of this Act that includes an inventory of existing education programs at DOE and the civilian National Laboratories and requires independent evaluations of those programs to be conducted within four years of the enactment of this act. Requires DOE to include the results of evaluations of educational programs run by the civilian National Laboratories as a factor when setting performance and incentive fees for those National Laboratory management and operations contractors.

SEC. 14. DEFINITIONS

Defines "Institution of Higher Education" and "National Laboratory" for this Act.

VIII. COMMITTEE VIEWS

NATIONAL SCIENCE FOUNDATION ROLE IN STEM EDUCATION

Science and mathematics education is a cornerstone of the historic mission of NSF. The National Science Foundation Act of 1950, which established NSF, directed NSF to support and strengthen science and mathematics education programs at all levels. NSF has accumulated a 50-year record of accomplishment in developing highly successful science and mathematics education programs, which are strongly supported by the education community. The Committee believes that it is vitally important that NSF continue to carry out its mission to improve K–12 and undergraduate education in science and math. NSF's peer review system, its connections with higher education, and its prestige give it a unique role in improving science and mathematics education that cannot be duplicated by any other federal agency.

RISING ABOVE THE GATHERING STORM

The NAS report, Rising Above the Gathering Storm, stresses the importance of improving K–12 education in the U.S., but also emphasizes the need for increasing the number of undergraduate and graduate students studying and choosing careers in STEM fields. The Committee endorses the NAS's focus on the link between a technologically-educated population and the U.S. ability to innovate and remain competitive, and this Act implements key education-related recommendations of Rising Above the Gathering Storm. The Act strengthens and expands existing programs, primarily at NSF, to enhance federal STEM education efforts, and creates no new programs.

SCIENCE AND MATHEMATICS EDUCATION IN K–12

Robert Noyce Teacher Scholarship Program

The Committee recognizes that the preparation and retention of excellent K–12 science and mathematics teachers is essential to improving science and mathematics education in the United States. The Act includes provisions for recruiting, training, and retaining teachers to ensure that schools have access to a pool of talented, qualified, and committed science and mathematics teachers.

The Committee strongly believes that strong STEM content knowledge and excellent pedagogical skills are both necessary for

success as a K–12 science and mathematics teacher. This Act expands the program element of the Noyce program to support and encourage the transformation of how K–12 science and mathematics teachers are educated in this country. In addition to providing scholarships to juniors and seniors, colleges and universities receiving Noyce grants will be required to offer a program that provides instruction (which may begin as early as freshman year) and early field teaching experiences, including interactions with teacher leaders and coursework developed by STEM and education faculty, to allow participants in the program both to graduate with STEM degrees and to meet requirements for teacher certification or licensing. The Committee also believes that the colleges and universities should develop and implement induction programs to support graduates of the program in their first few years of teaching in order to improve the retention of Noyce program graduates in the teaching profession. The Committee also believes that collaboration between STEM and education faculty is critical for the success of these programs. The Committee applauds the work of University of Texas at Austin on its UTeach program, which is a successful model of the type of teacher education and support program the Committee wishes to encourage.

The Committee believes that to maximize the impact of the teacher training programs supported through the Noyce Program, institutions receiving grants should make strong efforts to inform potential program participants about the program and the scholarships. NSF should support such recruitment efforts and use annual conferences of participants as opportunities to share best practices in recruitment as well as in other program components, such as coursework, mentoring, and field teaching experiences.

The NAS in Rising Above the Gathering Storm calls for federal programs to support recruiting 10,000 new science and mathematics teachers every year, and the appropriations authorized in this Act put the Noyce program on track to reach that level of effort in 2016.

The Committee expects NSF to do far more to publicize and promote participation by institutions of higher education in the Noyce Program, especially among schools that are more known for their rigorous STEM programs than they are for teacher preparation.

School and University Partnerships for Science and Mathematics Education

The updates contained in the Act to the existing Mathematics and Science Partnership program at NSF, now renamed the School and University Partnerships for Science and Mathematics Education program, reflect the recommendations the Committee has received from education experts who have encouraged a stronger focus on teacher training, especially in STEM content. The changes also address recommendations in this area by the NAS in Rising Above the Gathering Storm, particularly on providing master's degree programs for in-service teachers and training programs to prepare teachers to teach AP/IB science and mathematics courses. The Committee strongly believes that grant applications which focus on teacher training should be given strong priority by NSF. Additionally, the Committee is concerned about the extremely high attrition rates for new science and mathematics teachers and believes that

the development and use of teacher induction programs, which provide content instruction, mentoring, professional development, and other support to teachers in the first few years of their career, should be supported in order to help improve teacher retention.

Also, because of the importance of content training, the Act requires that the principal investigator for a Partnership grant be a science, mathematics, or engineering faculty member at the grantee institution. To improve the focus of the Partnership program, the Act requires that grants fall within the limits of $75,000 to $2,000,000 per year. By limiting grant size, the Committee hopes that proposed projects will focus on targeted approaches to improving science and mathematics education and thus allow clear evaluation of the effectiveness of each project.

In adding language allowing the development and dissemination of curriculum tools that will help foster inventiveness and innovation, the Committee recognizes the value of innovation in U.S. competitiveness and the economic benefits that the U.S. gains by being a culture that encourages and rewards innovation. To support and cultivate the next generation of inventive scientists and engineers, teachers should have access to curriculum tools that include activities such as open-ended problem solving; hands-on and "how things work" exercises; projects that emphasize creativity, design and teamwork; and lessons to raise the stature of inventors and invention in the eyes of young people.

SCIENCE, MATHEMATICS, TECHNOLOGY, AND ENGINEERING EDUCATION AT THE UNDERGRADUATE LEVEL

Undergraduate education is the first step toward a career in teaching and in other science, engineering, or mathematics fields; it is the primary source of education and training for technical workers; and, it is often the last time non-majors will take a class in science and mathematics. The Committee believes that NSF, due to its close relationship with institutions of higher education and its expertise and experience in education at all levels, has a critical role to play in improving undergraduate STEM education for majors and non-majors, especially future teachers. No other Federal agency has a clear responsibility for undergraduate STEM education.

The Act expands NSF's STEP to fund the creation of centers at colleges and universities to develop new approaches to undergraduate STEM education programs. The Committee intends that these centers focus not only on improving undergraduate teaching and courses at their own institutions, but also on developing and disseminating innovative curricula, laboratory experiences, and teaching and training methods that can be used throughout the country.

The Committee is also concerned that in running STEP, NSF has not seriously enforced the statutory requirement that an applicant set a numerical goal for increasing the number of STEM majors and that grantees be evaluated, in part, on the basis of whether they are meeting the numerical goals contained in their applications. The Committee expects STEP to be carried out pursuant to statute. This Act requires a report to Congress to ensure that NSF gathers data on majors at STEP institutions.

To ensure the widest possible impact of STEP grants, the Committee expects NSF to provide grantees with opportunities to discuss best practices for recruiting students into programs run by STEP grantees.

In addition to STEP, NSF currently carries out a range of other programs designed to improve undergraduate STEM education, and the Committee strongly supports the continuation of these activities, especially the Course, Curriculum, and Laboratory Improvement program.

SCIENCE, MATHEMATICS, TECHNOLOGY, AND ENGINEERING EDUCATION AT THE GRADUATE LEVEL

NSF continues to be the primary source of support for graduate students in many STEM fields. The Committee is particularly supportive of the IGERT Program because it not only provides support for graduate students but also facilitates the development of new graduate programs that reach across traditional disciplinary boundaries and may include internships and mentoring in industrial, national laboratory, academic, or other settings.

The Committee encourages NSF's ongoing efforts to collaborate with other agencies in support of the IGERT program. In particular, the Committee encourages NSF and DOE to work together to support projects that enable graduate education in advanced energy technology research and development, including projects that involve partnerships between schools, departments or programs of engineering and schools, departments or programs of design, architecture, and city, regional or urban planning.

PROFESSIONAL SCIENCE MASTER'S PROGRAMS

The Committee applauds the efforts by the Sloan Foundation and the Council of Graduate Schools (CGS) to support the development of Professional Science Master's programs. The Committee is aware of CGS plans to evaluate data related to graduates of these programs and expects NSF and CGS to work together to ensure that evaluation and assessment efforts are not duplicated in producing the study required under this act.

EVALUATION AND ASSESSMENT OF EDUCATION PROGRAMS

In 2006, Congress created the interagency Academic Competitiveness Council, which was formed to evaluate the effectiveness of STEM education programs and improve interagency coordination of these programs. The Committee encourages NSF and DOE, in assessing their education programs as required by this Act, to use methodologies that allow comparison of the impact and outcomes of the NSF and DOE programs to the effectiveness of education programs conducted at other federal agencies.

IX. COST ESTIMATE

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).

H.R. 5358 does not contain new budget authority, credit authority, or changes in revenues or tax expenditures. Assuming that the sums authorized under the bill are appropriated, H.R. 5358 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

June 22, 2006.

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. 5358, the Science and Mathematics Education for Competitiveness Act.

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

Sincerely,

Donald B. Marron,
Acting Director.

Enclosure.

H.R. 5358—Science and Mathematics Education for Competitiveness Act

Summary: H.R. 5358 would reauthorize certain programs carried out by the National Science Foundation (NSF). The bill would direct the NSF to continue funding for its division of undergraduate education and would specifically authorize appropriations for three grant or scholarship programs carried out by that division. In addition, the bill would direct the NSF to continue operating its centers for research on learning and education improvement and to allocate at least 1.5 percent of amounts appropriated for research and related activities each year to the integrative graduate education and research traineeship program (IGERT). Assuming appropriation of the specified and estimated amounts, CBO estimates that implementing H.R. 5358 would cost $131 million in fiscal year 2007 and $1.7 million over the 2007–2011 period. (An additional $500 million would be spent after 2011.)

The bill also would authorize the NSF to accept and use donations to support scholarships and other payments to students under the Robert Noyes teacher scholarship program. CBO estimates that providing this authority would have no effect on federal revenues (or spending of those revenues) because the agency already has similar authority under current law. Enacting this legislation would not affect other direct spending or revenues.

H.R. 5358 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA); any costs to state, local, or tribal governments would result from complying with conditions of federal assistance.

Estimated cost to the Federal Government: The estimated budgetary impact of H.R. 5358 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—					
	2006	2007	2008	2009	2010	2011
SPENDING SUBJECT TO APPROPRIATION						
Spending Under Current Law for NSF Science and Mathematics Education Programs:						
Budget Authority [a]	295	0	0	0	0	0
Estimated Outlays	281	218	86	28	6	0
Proposed Changes:						
Robert Noyce Scholarship Program:						
Authorization Level	0	50	70	90	110	130
Estimated Outlays	0	11	38	61	84	105
Science and Mathematics Education Partnerships:						
Authorization Level	0	63	73	83	93	103
Estimated Outlays	0	14	44	64	79	90
STEM Talent Expansion Program:						
Authorization Level	0	44	55	60	60	60
Estimated Outlays	0	10	32	47	56	59
Integrative Graduate Education and Research Traineeship Program:						
Estimated Authorization Level	0	66	67	69	70	71
Estimated Outlays	0	15	45	59	67	69
Centers for Research on Learning and Education Improvement:						
Estimated Authorization Level	0	26	26	27	27	28
Estimated Outlays	0	6	17	23	26	27
Other Undergraduate Education Programs:						
Estimated Authorization Level	0	116	118	120	122	125
Estimated Outlays	0	75	102	116	121	123
Total Proposed Changes:						
Estimated Authorization Level	0	365	410	449	483	516
Estimated Outlays	0	131	278	370	433	473
Spending Under H.R. 5358 for NSF Science and Mathematics Education Programs:						
Authorization Level [a]	295	365	410	449	483	516
Estimated Outlays	281	348	365	397	440	473

[a] The 2006 level is the amount appropriated for that year for the NSF programs that would be reauthorized by H.R. 5358.
Notes: STEM = Science, technology, engineering, and mathematics. Components may not sum to totals because of rounding.

Basis of estimate: For this estimate, CBO assumes that H.R. 5358 will be enacted during fiscal year 2006 and that the entire amounts specified by the bill or estimated to be necessary will be appropriated for each of fiscal years 2007 through 2011. Estimated outlays are based on historical patterns for the authorized programs.

H.R. 5358 would specifically authorize the appropriation of about $1.1 billion over the 2007–2011 period for three educational grant programs carried out by NSF's division of undergraduate education. CBO estimates that the bill also would authorize the appropriation of an additional $1.1 billion over that period for grants by directing the agency to continue to carry out other graduate and undergraduate grant programs. This estimate is based on appropriations in recent years for these activities, adjusted annually for anticipated inflation. Assuming appropriation of these amounts, CBO estimates that carrying out H.R. 5358 would cost $131 million in 2007 and about $1.7 billion over the 2007–2011 period.

Intergovernmental and private-sector impact: H.R. 5358 contains no intergovernmental or private-sector mandates as defined in UMRA. The bill would authorize activities and grant funds that would benefit institutions of higher education. Any costs they might incur would result from complying with conditions of federal assistance.

Estimate prepared by: Federal Costs: Deborah Reis; Impact on State, Local, and Tribal Governments: Lisa Ramirez-Branum; Impact on the Private Sector: Craig Cammarata.

Estimate approved by: Peter H. Fontaine; Deputy Assistant Director for Budget Analysis.

XI. Compliance With Public Law 104–4 (Unfunded Mandates)

H.R. 5358 contains no unfunded mandates.

XII. Committee Oversight Findings and Recommendations

The Committee on Science's oversight findings and recommendations are reflected in the body of this report.

XIII. Statement on General Performance Goals and Objectives

Pursuant to clause (3)(c) of House rule XIII, the goals of H.R. 5358 are to update the activities and extend the authorization for the Noyce Program at NSF; update the activities of the Mathematics and Science Partnership program at NSF; authorize specific program activities at NSF and DOE; and conduct studies of Broader Impacts Criterion, K–12 school laboratory equipment, and professional science master's programs to improve the quality of STEM education.

XIV. Constitutional Authority Statement

Article I, section 8 of the Constitution of the United States grants Congress the authority to enact H.R. 5358.

XV. Federal Advisory Committee Statement

H.R. 5358 does not establish nor authorize the establishment of any advisory committee.

XVI. Congressional Accountability Act

The Committee finds that H.R. 5358 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).

XVII. Statement on Preemption of State, Local, or Tribal Law

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

XVIII. 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):

NATIONAL SCIENCE FOUNDATION AUTHORIZATION ACT OF 2002

* * * * * * *

SEC. 4. DEFINITIONS.

In this Act:

(1) * * *

* * * * * * *

[(6) ELIGIBLE NONPROFIT ORGANIZATION.—The term "eligible nonprofit organization" means a nonprofit research institute, or a nonprofit professional association, with demonstrated experience and effectiveness in mathematics or science education as determined by the Director.]

(6) ELIGIBLE NONPROFIT ORGANIZATION.—The term "eligible nonprofit organization" means a nonprofit organization, such as a museum or science center, involved in the preparation, training, or certification of science and mathematics teachers.

* * * * * * *

[(8) HIGH-NEED LOCAL EDUCATIONAL AGENCY.—The term "high-need local educational agency" means a local educational agency that meets one or more of the following criteria:

[(A) It has at least one school in which 50 percent or more of the enrolled students are eligible for participation in the free and reduced price lunch program established by the Richard B. Russell National School Lunch Act (42 U.S.C. 1751 et seq.).

[(B) It has at least one school in which—

[(i) more than 34 percent of the academic classroom teachers at the secondary level (across all academic subjects) do not have an undergraduate degree with a major or minor in, or a graduate degree in, the academic field in which they teach the largest percentage of their classes; or

[(ii) more than 34 percent of the teachers in two of the academic departments do not have an undergraduate degree with a major or minor in, or a graduate degree in, the academic field in which they teach the largest percentage of their classes.

[(C) It has at least one school whose teacher attrition rate has been 15 percent or more over the last three school years.]

(8) HIGH-NEED LOCAL EDUCATIONAL AGENCY.—The term "high-need local educational agency" means a local educational agency that—

(A) is receiving grants under title I of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 6301 et seq) as a result of having within its jurisdiction concentrations of children from low income families; and

(B) is experiencing a shortage of highly qualified teachers, as defined in section 9101 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 7801), in the fields of science, mathematics, or engineering.

* * * * * * *

(11) [MASTER TEACHER] *TEACHER LEADER*.—The term "[master teacher] *teacher leader*" means a mathematics or science teacher who works to improve the instruction of mathematics or science in kindergarten through grade 12 through—

(A) * * *

* * * * * * *

(E) providing professional development, including for the purposes of training other [master teachers] *teacher leaders*, to mathematics and science teachers.

* * * * * * *

SEC. 8. SPECIFIC PROGRAM AUTHORIZATIONS.

From amounts authorized to be appropriated under section 5, the Director shall carry out the Foundation's research and education programs, including the following initiatives in accordance with this section:

(1) * * *

* * * * * * *

(7) SCIENCE, MATHEMATICS, ENGINEERING, AND TECHNOLOGY TALENT EXPANSION PROGRAM.—(A) A program of [competitive, merit-based, multi-year grants for eligible applicants to increase the number of students studying toward and completing associate's or bachelor's degrees in science, mathematics, engineering, and technology, particularly in fields that have faced declining enrollment in recent years] *competitive, merit-reviewed multiyear grants for eligible applicants to improve undergraduate education in science, mathematics, engineering and technology through—*

(i) the creation of programs to increase the number of students studying toward and completing associate's or bachelor's degrees in science, mathematics, engineering and technology, particularly in fields that have faced declining enrollment in recent years; and

(ii) the creation of centers to develop undergraduate curriculum, teaching methods for undergraduate courses, and methods to better train professors and teaching assistants who teach undergraduate courses to increase the number of students completing undergraduate courses in science, mathematics, technology, and engineering, including the number of nonmajors, and to improve student academic achievement in those courses.

Grants made under clause (ii) shall be awarded jointly through the Education and Human Resources Directorate and at least 1 research directorate of the Foundation.

(B) In selecting projects [under this paragraph] *under subparagraph (A)(i)*, the Director shall strive to increase the number of students studying toward and completing baccalaureate degrees, concentrations, or certificates in science, mathematics, engineering, or technology who are individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b).

(C)*(i)* The types of projects the Foundation may support under [this paragraph] *subparagraph (A)(i)* include those that promote high quality—

[(i)] *(I)* interdisciplinary teaching;

[(ii)] *(II)* undergraduate-conducted research;

[(iii)] *(III)* mentor relationships for students;

[(iv)] *(IV)* bridge programs that enable students at community colleges to matriculate directly into baccalaureate science, mathematics, engineering, or technology programs;

[(v)] *(V)* internships carried out in partnership with industry; and

[(vi)] *(VI)* innovative uses of digital technologies, particularly at institutions of higher education that serve high numbers or percentages of economically disadvantaged students.

(ii) The types of activities the Foundation may support under subparagraph (A)(ii) include—

(I) creating model curricula and laboratory programs;

(II) developing and demonstrating research-based instructional methods and technologies;

(III) developing methods to train graduate students and faculty to be more effective teachers of undergraduates;

(IV) conducting programs to disseminate curricula, instructional methods, or training methods to faculty at the grantee institutions and at other institutions;

(V) conducting assessments of the effectiveness of the Center at accomplishing the goals described in subparagraph (A)(ii); and

(VI) conducting any other activities the Director determines will accomplish the goals described in subparagraph (A)(ii).

(D)(i) In order to receive a grant under [this paragraph] *subparagraph (A)(i)*, an eligible applicant shall establish targets to increase the number of students studying toward and completing associate's or bachelor's degrees in science, mathematics, engineering, or technology.

(ii) A grant under [this paragraph] *subparagraph (A)(i)* shall be awarded for a period of 5 years, with the final 2 years of funding contingent on the Director's determination that satisfactory progress has been made by the grantee toward meeting the targets established under clause (i).

* * * * * * *

(iv) A grant under subparagraph (A)(ii) shall be awarded for 5 years, and the Director may extend such a grant for up to 2 additional 3 year periods.

(E) For each grant awarded under [this paragraph] *subparagraph (A)(i)* to an institution of higher education, at least 1 principal investigator shall be in a position of administrative leadership at the institution of higher education, and at least 1 principal investigator shall be a faculty member from an academic department included in the work of the project. For each grant awarded to a consortium or partnership, at each institution of higher education participating in the consortium or partnership, at least 1 of the individuals responsible for carrying out activities authorized under [this paragraph] *subparagraph (A)(i)* at that institution shall be in a position of administrative leadership at the institution, and at least 1 shall

be a faculty member from an academic department included in the work of the project at that institution.

(F) Grants awarded under subparagraph (A)(ii) shall be carried out by a department or departments of science, mathematics, or engineering at institutions of higher education (or a consortia thereof), which may partner with education faculty. Applications for awards under subparagraph (A)(ii) shall be submitted to the Director at such time, in such manner, and containing such information as the Director may require. At a minimum, the application shall include—

(i) a description of the activities to be carried out by the Center;

(ii) a plan for disseminating programs related to the activities carried out by the Center to faculty at the grantee institution and at other institutions;

(iii) an estimate of the number of faculty, graduate students (if any), and undergraduate students who will be affected by the activities carried out by the Center; and

(iv) a plan for assessing the effectiveness of the Center at accomplishing the goals described in subparagraph (A)(ii).

(G) in evaluating the applications submitted under subparagraph (F), the Director shall consider, at a minimum—

(i) the ability of the applicant to effectively carry out the proposed activities, including the dissemination activities described in subparagraph (C)(ii)(IV); and

(ii) the extent to which the faculty, staff, and administrators of the applicant institution are committed to improving undergraduate science, mathematics, and engineering education.

(H) In awarding grants under subparagraph (A)(ii), the Director shall endeavor to ensure that a wide variety of science, mathematics, and engineering fields and types of institutions of higher education, including 2-year colleges, are covered, and that—

(i) at least 1 Center is housed at a Doctoral/Research University as defined by the Carnegie Foundation for the Advancement of Teaching; and

(ii) at least 1 Center is focused on improving undergraduate education in an interdisciplinary area.

(I) The Director shall convene an annual meeting of the awardees under this paragraph to foster collaboration and to disseminate the results of the Centers and the other activities funded under this paragraph.

[(F)**]** *(J)* In this paragraph, the term "eligible applicant" means—

(i) * * *

* * * * * * *

SEC. 9. [MATHEMATICS AND SCIENCE EDUCATION PARTNERSHIPS] ***SCHOOL AND UNIVERSITY PARTNERSHIPS FOR SCIENCE AND MATHEMATICS EDUCATION.***

(a) PROGRAM AUTHORIZED.—

(1) * * *

(2) PARTNERSHIPS.—**[**(A)**]** In order to be eligible to receive a grant under this subsection, an institution of higher education, *through 1 or more of its departments in science, mathematics,*

or engineering, or eligible nonprofit organization (or consortium of such institutions or organizations) shall enter into a partnership with one or more local educational agencies that may also include [a State educational agency] *education faculty from the participating institution or institutions of higher education, a State educational agency,* or one or more businesses.

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

(3) USES OF FUNDS.—Grants awarded under this subsection shall be used for activities that draw upon the expertise of the partners to improve elementary or secondary education in mathematics or science and that are consistent with State mathematics and science student academic achievement standards, including—

(A) * * *

(B) offering *content-specific* professional development programs, including summer or academic year institutes or workshops, *which are* designed to strengthen the capabilities of mathematics and science teachers *and which may include teacher training activities to prepare science and mathematics teachers to teach Advanced Placement and International Baccalaureate science and mathematics courses*;

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

* * * * * * *

(E) developing a cadre of [master teachers] *teacher leaders* who will promote reform and improvement in schools;

* * * * * * *

(I) developing initiatives to increase and sustain the number, quality, and diversity of prekindergarten through grade 12 teachers of mathematics and science, *including model induction programs for teachers in their first 2 years of teaching,* especially in underserved areas;

* * * * * * *

(K) [developing and offering mathematics or science enrichment programs for students, including after-school and summer programs;] *developing educational programs and materials for use in and conducting mathematics or science enrichment programs for students, including after-school programs and summer camps for students described in subsection (b)(2)(G);*

* * * * * * *

(4) [MASTER TEACHERS] *TEACHER LEADERS*.—Activities carried out in accordance with paragraph (3)(E) shall—

(A) emphasize the training of [master teachers] *teacher leaders* who will improve the instruction of mathematics or science in kindergarten through grade 12;

(B) include training in both content and pedagogy; and

(C) provide training only to teachers who will be granted sufficient nonclassroom time to serve as [master teachers] *teacher leaders*, as demonstrated by assurances their employing school has provided to the Director, in such time and such manner as the Director may require.

* * * * * * *

(8) MASTER'S DEGREE PROGRAMS.—Activities carried out in accordance with paragraph (3)(B) shall include the development and offering of master's degree programs for in-service mathematics and science teachers that will strengthen their subject area knowledge and pedagogical skills. Grants provided under this section may be used to develop and implement courses of instruction for the master's degree programs, which may involve online learning, and develop related educational materials.

(9) MENTORS FOR ADVANCED PLACEMENT COURSES TEACHERS AND STUDENTS.—Partnerships carrying out activities to prepare science and mathematics teachers to teach Advanced Placement and International Baccalaureate science and mathematics courses in accordance with paragraph (3)(B) shall encourage companies employing scientists, mathematicians, or engineers to provide mentors to teachers and students and provide for the coordination of such mentoring activities.

(10) INVENTIVENESS.—Activities carried out in accordance with paragraph (3)(H) may include the development and dissemination of curriculum tools that will help foster inventiveness and innovation.

(b) SELECTION PROCESS.—

(1) * * *

(2) REVIEW OF APPLICATIONS.—In evaluating the applications submitted under paragraph (1), the Director shall consider, at a minimum—

(A) * * *

* * * * * * *

(E) the extent to which the evaluation described in paragraph (1)(E) will be independent and based on objective measures;

[(E)] *(F)* the likelihood that the partnership will demonstrate activities that can be widely implemented as part of larger scale reform efforts; and

[(F)] *(G)* the extent to which the activities will encourage the interest of individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b) in mathematics, science, engineering, and technology and will help prepare such individuals to pursue postsecondary studies in these fields.

(3) AWARDS.—In awarding grants under this section, the Director shall—

(A) give priority to applications in which the partnership includes a high-need local educational agency or a high-need local educational agency in which at least one school

does not make adequate yearly progress, as determined pursuant to part A of title I of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 6311 et seq.); [and]

(B) give priority to applications that include teacher training activities as the main focus of the proposal; and

[(B)] *(C)* ensure that, to the extent practicable, a substantial number of the partnerships funded under this section include businesses.

(4) MINIMUM AND MAXIMUM GRANT SIZE.—A grant awarded under this section shall be not less than $75,000 or greater than $2,000,000 for any fiscal year.

(c) ACCOUNTABILITY AND DISSEMINATION.—

(1) * * *

[(2) DISSEMINATION OF RESULTS.—(A) The results of the evaluation required under paragraph (1) shall be made available to the public and shall be provided to the Committee on Science of the House of Representatives, the Committee on Commerce, Science, and Transportation of the Senate, and the Committee on Health, Education, Labor, and Pensions of the Senate.

[(B) Materials developed under the program established under subsection (a) that are demonstrated to be effective shall be made widely available to the public.]

(2) REPORT ON MODEL PROJECTS.—The Director shall determine which completed projects funded through the program under this section should be seen as models to be replicated on a more expansive basis at the State or national levels. Not later than 1 year after the date of enactment of this paragraph, the Director shall transmit a report describing the results of this study to the Committee on Science and the Committee on Education and the Workforce of the House of Representatives and to the Committee on Commerce, Science, and Transportation and the Committee on Health, Education, Labor, and Pensions of the Senate.

(3) REPORT ON EVALUATIONS.—Not later than 4 years after the date of enactment of this paragraph, the Director shall transmit a report summarizing the evaluations required under subsection (b)(1)(E) of grants received under this program and describing any changes to the program recommended as a result of these evaluations to the Committee on Science and the Committee on Education and the Workforce of the House of Representatives and to the Committee on Commerce, Science, and Transportation and the Committee on Health, Education, Labor, and Pensions of the Senate. Such report shall be made widely available to the public.

[(3)] *(4)* ANNUAL MEETING.—The Director, in consultation with the Secretary of Education, shall convene an annual meeting of the partnerships participating under this section to foster greater national collaboration.

[(4)] *(5)* REPORT ON COORDINATION.—The Director, in consultation with the Secretary of Education, shall provide an annual report to the Committee on Science of the House of Representatives, the Committee on Education and the Workforce of the House of Representatives, the Committee on Commerce, Science, and Transportation of the Senate, and the Committee

on Health, Education, Labor, and Pensions of the Senate describing how the program authorized under this section has been and will be coordinated with the program authorized under part B of title II of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 6601 et seq.). The report under this paragraph shall be submitted along with the President's annual budget request.

[(5)] *(6)* TECHNICAL ASSISTANCE.—At the request of an eligible partnership or a State educational agency, the Director shall provide the partnership or agency with technical assistance in meeting any requirements of this section, including providing advice from experts on how to develop—

(A) * * *

* * * * * * *

(d) DEFINITION.—In this section, the term "mathematics and science teacher" means a mathematics, science, or technology teacher at the elementary school or secondary school level.

SEC. 10. ROBERT NOYCE *TEACHER* SCHOLARSHIP PROGRAM.

(a) SCHOLARSHIP PROGRAM.—

(1) IN GENERAL.—The Director shall carry out a program to award grants to institutions of higher education (or consortia of such institutions) [to provide scholarships, stipends, and programming designed] to recruit and train mathematics and science teachers *and to provide scholarships and stipends to students participating in the program*. Such program shall be known as the "Robert Noyce *Teacher* Scholarship Program".

* * * * * * *

(3) USE OF GRANTS.—Grants provided under this section shall be used by institutions of higher education or consortia—

(A) to develop and implement a program to [encourage top college juniors and seniors] *recruit and prepare undergraduate students* majoring in mathematics, science, and engineering at the grantee's institution to become *qualified as* mathematics and science teachers, through—

(i) administering scholarships in accordance with subsection (c);

(ii) offering [programs to help scholarship recipients] *academic courses and early field teaching experiences designed to prepare students participating in the program* to teach in elementary schools and secondary schools, including [programs that will result in] *such preparation as is necessary to meet requirements for* teacher certification or [licensing; and] *licensing;*

(iii) offering programs to [scholarship recipients] *students participating in the program*, both before and after they receive their baccalaureate degree, to [enable the recipients] *enable the students* to become better mathematics and science teachers, to fulfill the service requirements of this section, and to exchange ideas with others in their fields; [or] *and*

(iv) providing summer internships for freshman and sophomore students participating in the program; or

(B) to develop and implement a program to [encourage] *recruit and prepare* science, mathematics, or engineering

professionals to become *qualified as* mathematics and science teachers, through—

(i) administering stipends in accordance with subsection (d);

[(ii) offering programs to help stipend recipients obtain teacher certification or licensing; and]

(ii) offering academic courses and field teaching experiences designed to prepare stipend recipients to teach in elementary schools and secondary schools, including such preparation as necessary to meet requirements for teacher certification or licensing;

* * * * * * *

(4) ELIGIBILITY REQUIREMENT.—To be eligible for an award under this section, an institution of higher education (or consortia of such institutions) shall ensure that specific faculty members and staff from the institution's mathematics, science, or engineering departments and specific education faculty are designated to carry out the development and implementation of the program. An institution of higher education may also include teacher leaders to participate in developing the pedagogical content of the program and to supervise students participating in the program in their field teaching experiences. No institution of higher education shall be eligible for an award unless faculty from the institution's mathematics, science, or engineering departments are active participants in the program.

(b) SELECTION PROCESS.—

(1) APPLICATION.—An institution of higher education or consortium 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—

(A) a description of the [scholarship or stipend] program that the applicant intends to operate, including the number of scholarships *and summer internships* or the size and number of stipends the applicant intends to award, *the type of activities proposed for the recruitment of students to the program,* and the selection process that will be used in awarding the scholarships or stipends;

(B) evidence that the applicant has the capability to administer the [scholarship or stipend] program in accordance with the provisions of this section[; and], *which may include a description of any existing programs at the applicant's institution that are targeted to the education of science and mathematics teachers and the number of teachers graduated annually from such programs;*

[(C) a description of the programming that will be offered to scholarship or stipend recipients during and after their matriculation in the program for which the scholarship or stipend is received.]

(C) a description of the academic courses and field teaching experiences required under subsection (a)(3)(A)(ii) and (B)(ii), including—

(i) a description of the undergraduate program that will enable a student to graduate in 4 years with a

major in mathematics, science, or engineering and to obtain teacher certification or licensing;

(ii) a description of the field teaching experiences proposed; and

(iii) evidence of agreements between the applicant and the schools or school districts that are identified as the locations at which field teaching experiences will occur;

(D) a description of the programs required under subsection (a)(3)(A)(iii) and (B)(iii), including activities to assist new teachers in fulfilling their service requirements under this section; and

(E) an identification of the applicant's mathematics, science, or engineering faculty and its education faculty who will carry out the development and implementation of the program as required under subsection (a)(4).

(2) REVIEW OF APPLICATIONS.—In evaluating the applications submitted under paragraph (1), the Director shall consider, at a minimum—

(A) * * *

(B) the extent to which the applicant's mathematics, science, or engineering faculty and its education faculty have worked or will work collaboratively to design new or revised curricula that recognizes the specialized pedagogy required to teach mathematics and science effectively in elementary and secondary schools;

[(B)] *(C)* the extent to which the applicant is committed to making the program a central organizational focus;

[(C)] *(D)* the degree to which the proposed programming will enable scholarship or stipend recipients to become successful mathematics and science teachers;

[(D)] *(E)* the number and quality of the students that will be served by the program; and

[(E)] *(F)* the ability of the applicant to recruit students who would otherwise not pursue a career in teaching.

(c) SCHOLARSHIP REQUIREMENTS.—

(1) * * *

* * * * * * *

(3) AMOUNT.—The Director shall establish for each year the amount to be awarded for scholarships under this section for that year, which shall be not less than [$7,500] *$10,000* per year, except that no individual shall receive for any year more than the cost of attendance at that individual's institution. Individuals may receive a maximum of 2 years [of scholarship support] *of scholarship support, unless the Director establishes a policy by which part-time students may receive additional years of support*.

(4) 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*, with a maximum service requirement of 4 years*. [Service required under this paragraph shall be performed in a high-need local educational agency.]

(5) EXCEPTION.—The period of service obligation under paragraph (4) is reduced by 1 year for scholarship recipients whose service is performed in a high-need local educational agency.

(d) STIPENDS.—

(1) IN GENERAL.—Stipends under this section shall be available only to mathematics, science, and engineering professionals who, while receiving the stipend, are enrolled in a program [to receive certification or licensing to teach] *established under subsection (a)(3)(B)*.

(2) SELECTION.—Individuals shall be selected to receive stipends under this section primarily on the basis of academic merit *and professional achievement*, with consideration given to financial need and to the goal of promoting the participation of individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b).

(3) DURATION.—Individuals may receive a maximum of [1 year] *16 months* of stipend support.

(4) SERVICE OBLIGATION.—If an individual receives a stipend under this section, 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 paragraph shall be performed in a high-need local educational agency.

* * * * * * *

(g) FAILURE TO COMPLETE SERVICE OBLIGATION.—

(1) * * *

(2) AMOUNT OF REPAYMENT.—(A) If a circumstance described in paragraph (1) occurs before the completion of one year of a service obligation under this section, 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—

(i) the total amount of awards received by such individual under this section; plus

(ii) the interest on the amounts of such awards which would be payable if at the time the awards 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.] *Treasurer of the United States.*

* * * * * * *

(i) DEFINITIONS.—In this section—

(1) * * *

* * * * * * *

(3) 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 *or had a career in* that field or a related area;

* * * * * * *

(j) SCIENCE AND MATHEMATICS SCHOLARSHIP GIFT FUND.—In accordance with section 11(f) of the National Science Foundation Act

of 1950, the Director is authorized to accept donations from the private sector to support scholarships, stipends, or internships associated with programs under this section.

(k) ASSESSMENT OF TEACHER RETENTION.—Not later than 4 years after the date of enactment of this subsection, the Director shall transmit to Congress a report on the effectiveness of the program carried out under this section regarding the retention of participants in the teaching profession beyond the service obligation required under this section.

(l) AUTHORIZATION OF APPROPRIATIONS.—Except as provided in subsection (m), there are authorized to be appropriated to the Director for the Robert Noyce Teacher Scholarship Program—

(1) $50,000,000 for fiscal year 2007, of which at least $7,500,000 shall be used for capacity building activities described in subsection (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii);

(2) $70,000,000 for fiscal year 2008, of which at least $10,500,000 shall be used for capacity building activities described in subsection (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii);

(3) $90,000,000 for fiscal year 2009, of which at least $13,500,000 shall be used for capacity building activities described in subsection (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii);

(4) $110,000,000 for fiscal year 2010, of which at least $16,500,000 shall be used for capacity building activities described in subsection (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii); and

(5) $130,000,000 for fiscal year 2011, of which at least $19,500,000 shall be used for capacity building activities described in subsection (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii).

(m) EXCEPTION.—For any fiscal year for which the funding allocated for activities under this section is less than $50,000,000, the amount of funding available for capacity building activities described in paragraphs (1) through (5) of subsection (l) shall not exceed 15 percent of the allocated funds.

XIX. COMMITTEE RECOMMENDATIONS

On June 7, 2006, a quorum being present, the Committee on Science favorably reported H.R. 5358, the Science and Mathematics Education for Competitiveness Act, as amended, by a voice vote and recommended its enactment.

XX. COMMITTEE CORRESPONDENCE

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE
SUITE 2320 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515–6301
(202) 225–6371
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June 7, 2006

The Honorable Howard P. "Buck" McKeon
Chairman
Committee on Education and the Workforce
2181 Rayburn House Office Building
Washington, DC 20515

Dear Mr. Chairman:

Thank you for your letter regarding the consideration of H.R. 5358, Science and Mathematics Education for Competitiveness 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. 5358 or similar legislation. The exchange of letters between our two committees will be included in the Committee report on H.R. 5358 and will be made part of the floor record.

Thank you for your attention to this matter.

Sincerely,

SHERWOOD BOEHLERT
Chairman

cc: The Honorable John V. Sullivan

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TIMOTHY H. BISHOP, NEW YORK

June 6, 2006

The Honorable Sherwood Boehlert
Chairman, Committee on Science
2320 Rayburn HOB
Washington, D.C. 20515

Dear Chairman Boehlert:

I am writing to confirm our mutual understanding with respect to the consideration of H.R. 5358, *"Science and Mathematics Education for Competitiveness Act"*. The bill was referred to the Committee on Science. However, as you know, the Committee on Education and the Workforce has a jurisdictional interest in H.R. 5358.

Given the importance of moving this bill forward promptly, I do not intend to request the sequential referral of H.R. 5358 to the Committee on the Education and the Workforce. However, I do so only with the understanding that this procedural route should not be construed to prejudice the Education and Workforce Committee's jurisdictional interests and prerogatives on this bill or any other similar legislation and will not be considered as precedent for consideration of matters of jurisdictional interest to my committee in the future. Furthermore, should this bill or similar legislation be considered in a conference with the Senate, I would expect members of the Committee on Education and the Workforce be appointed to the conference committee on these provisions.

Finally, I ask that you include a copy of our exchange of letters in your committee's report on H.R. 5358 and in the *Congressional Record* during the consideration of this bill. If you have questions regarding this matter, please do not hesitate to call me. I thank you for your consideration.

Sincerely,

Buck McKeon

HOWARD P. "BUCK" MCKEON
Chairman

cc: The Honorable J. Dennis Hastert
The Honorable John A. Boehner
The Honorable George Miller
The Honorable John Sullivan, Parliamentarian

XXI: PROCEEDINGS OF THE FULL COMMITTEE MARKUP ON H.R. 5358, SCIENCE AND MATHEMATICS EDUCATION FOR COMPETITIVENESS ACT

WEDNESDAY, JUNE 7, 2006

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE,
Washington, DC.

The Committee met, pursuant to call, at 2:39 p.m., in Room 2318 of the Rayburn House Office Building, Hon. Sherwood L. Boehlert [Chairman of the Committee] presiding.

Chairman BOEHLERT. I want to welcome everyone here for this markup on three important and bipartisan bills. The Committee on Science will come to order, as I started to say.

Pursuant to notice, the Committee on Science meets to consider H.R. 5136, the *National Integrated Drought Information System Act of 2006;* H.R. 5358, the *Science and Mathematics Education for Competitiveness Act;* and H.R. 5356, the *Research for Competitiveness Act.*

I ask unanimous consent for the authority to recess the Committee at any point during consideration of these matters, and without objection, it is so ordered.

We will now proceed with the markup beginning with opening statements. I will go first, followed by my distinguished colleague and partner in this venture, Mr. Gordon.

I am going to make all my general comments on today's bills now, and not speak on the bills later on. Since we have to squeeze in a lot of business this afternoon between Floor votes, and according to the report from the Floor, we can expect a series of votes some time in the 4:00 to 4:15 timeframe.

As usual with this committee, these bills reflect a lot of bipartisan work to solve real problems in practical ways.

Our first bill today will be a measure to improve drought forecasting and monitoring, introduced by Mr. Hall. I appreciate Mr. Hall bringing this matter to our attention.

Drought may seem like something that is easy to detect, but hard to do anything about; but that turns out to be wrong on both counts. It is tricky to figure out when a drought is developing, but if one knows, one can take many steps to alter water usage to mitigate drought's often severe economic consequences. So we need to pay more attention to this costly phenomenon, and Mr. Hall's bill, building on existing federal efforts, will enable us to improve drought forecasting and monitoring, which will save billions, with

a "B," billions of dollars. So, I expect this bill to move smoothly today, and on the House Floor. We will have one manager's amendment today, to reduce the authorization levels, to make that progress to the Floor a little easier.

The other two bills we will take up today are the Committee's long-awaited innovation package.

Our goal here is to take action on the recommendations of the National Academy of Sciences, the Council on Competitiveness, AEA, the Business Roundtable, the National Association of Manufacturers, and others, who have been calling for the U.S. to shore up its competitiveness by focusing more attention and more dollars on research and education.

These calls were really music to our ears, because we have been issuing the same entreaties ourselves on this committee for a number of years, and especially in the last couple of years, as the challenge to future U.S. competitiveness has never become clearer.

But we didn't want to answer those calls with a laundry list of new programs of dubious value, that would be unlikely to ever get funded. It might give us a lot of satisfaction and some fancy press releases, but that is not what this committee is about. We are about results. Indeed, we looked around to see what is working right now, or what has worked in the recent past, and then, we extended or expanded or built on those successful programs, and the result is a focused, bipartisan measure that should be able to move swiftly through the House.

This measure is an intelligent middle ground between those who want to create scores of new, untested, expensive programs, and those who argue that all that is necessary is to increase overall funding for basic research, and leave everything else to chance. If we are to remain competitive, then we have to bolster key programs at the National Science Foundation, especially focused on K–12 and undergraduate education, and it is the prerogative of the Congress to do that.

I want to thank Dr. Schwarz and Mr. McCaul, two active freshmen on this committee with a deep understanding of these issues, for introducing these bills.

And I want to thank Mr. Gordon and the Members on both sides of the aisle, who worked with us on developing the final versions of these bills that are in the amendments in the nature of a substitute, including Dr. Ehlers and Ms. Biggert and Mr. Calvert, Ms. Jackson Lee and Mr. Green, and Mr. Honda. You get the idea of how we operate. Fingerprints of Members on both sides of the aisle are all over these bills, and that is the way it should be.

The Schwarz bill focuses on education programs at the National Science Foundation, which runs programs that are critical to improving math and science education at all levels. The bill includes enhancing and extending the Noyce Scholarship program, one of my pet projects, to attract and better train science and math teachers. We also give renewed emphasis to the Math and Science Partnership program, now renamed the School and University Partnership Program.

And we underscore NSF's role in the sometimes neglected, but critical area of undergraduate education. We also give clear author-

ity to the Department of Energy for education programs, and we require an inventory and an evaluation of those programs.

In Mr. McCaul's bill, we bolster research by ensuring that both NSF and DOE, we will set aside funding for young researchers, who are likely to perform the most creative and pathbreaking work. And we revive and idea from the 1980s, to try to get industry interested in these young academic researchers and in their long-term, basic research.

I would add that both of these bills, and the underlying 2002 NSF Act, direct that the programs in these bills, among other things, help bring more individuals from under-represented groups into science, math, and engineering, and that is a goal that many Members of this committee have been very active in pursuing.

So, we are taking action today, as we promised when we heard from the leaders of the National Academies Gathering Storm panel last year. We are setting a realistic agenda to increase U.S. investment in research and education in carefully targeted ways.

I look forward to moving this legislation today, and to continuing efforts to see it signed into law this year. And I will continue to work with the appropriators to see that they provide the funding called for in the American Competitiveness Initiative and in these bills.

Now, it is my privilege to turn to my partner in this venture, the distinguished gentleman from Tennessee, Mr. Gordon.

[The prepared statement of Chairman Boehlert follows:]

PREPARED STATEMENT OF CHAIRMAN SHERWOOD L. BOEHLERT

I want to welcome everyone here for this markup on three important and bipartisan bills. I'm going to make all my general comments on today's bills now and not speak on the bills later, since we have to squeeze in a lot of business this afternoon between Floor votes.

As usual with this committee, these bills reflect a lot of bipartisan work to solve real problems in practical ways.

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These calls were really music to our ears because we've been issuing the same entreaties ourselves for years, and especially in the last couple of years as the challenge to future U.S. competitiveness has become ever clearer.

But we didn't want to answer these calls with a laundry list of new programs of dubious value that would be unlikely to ever get funded. Instead, we looked around to see what is working right now or what has worked in the recent past, and then we extended or expanded or built on those successful programs. And the result is

a focused, bipartisan measure that should be able to move swiftly through the House.

This measure is an intelligent middle-ground between those who want to create scores of new, untested, expensive programs and those who argue that all that's necessary is to increase overall funding for basic research and leave everything else to chance. If we are to remain competitive, then we have to bolster key programs at the National Science Foundation (NSF), especially programs focused on K–12 and undergraduate education, and it's the prerogative of the Congress to do that.

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And we underscore NSF's role in the sometimes neglected, but critical area of undergraduate education. We also give clear authority to the Department of Energy (DOE) for education programs, and we require an inventory and evaluation of those programs.

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I would add that both these bills, and the underlying 2002 NSF Act, direct that the programs in these bills, among other things, help bring more individuals from under-represented into science, math and engineering.

So we're taking action today as we promised when we heard from the leaders of the National Academy's Gathering Storm panel last year. We are setting a realistic agenda to increase U.S. investment in research and education in carefully targeted ways.

I look forward to moving this legislation today, and to continuing efforts to see it signed into law this year. And I will continue to work with the appropriators to see that they provide the funding called for in the American Competitiveness Initiative and in these bills.

[The prepared statement of Mr. Ehlers follows:]

PREPARED STATEMENT OF REPRESENTATIVE VERNON J. EHLERS

There are many ways we can foster innovation and competition at the national level, but the most critical is the support of education in science, technology, engineering and mathematics fields. I am pleased that today's bills artfully address this area by focusing on programs that maximize innovation and educational opportunities. By addressing teacher training, graduate interdisciplinary studies, and research in areas that bridge scientific fields, these bills combine to provide a comprehensive alliance putting us on the right track to remain competitive in today's global economy. NSF education programs play a strong role in promoting our economic competitiveness and national security and I am glad that my colleagues on the Committee recognize that this treasure trove of knowledge the Foundation represents should not be overlooked. The bills also demonstrate a strong commitment toward fundamental research, and place an emphasis on the promise of young research professors.

I look forward to working with my colleagues and the scientific community to advance this important legislation. I believe that both bills align with the mission of bolstering American Competitiveness, and will support them strongly when they are considered by the whole House.

[The prepared statement of Ms. Johnson follows:]

PREPARED STATEMENT OF REPRESENTATIVE EDDIE BERNICE JOHNSON

Thank you, Mr. Chairman and Ranking Member.

I am happy that the Republican leadership has finally put together a package of legislation in response to the President's call for increased national competitiveness in science, technology, engineering and math.

This initiative underscores the recommendations of several important reports, including the report called *Rising Above the Gathering Storm,* released last year by the National Academy of Sciences.

A nation lacking science and math competitiveness is a nation lacking a future of prosperity. Advances in medicine, engineering and technology have touched every aspect of our lives.

The bills up for consideration today focus on particular weaknesses in our national scientific enterprise.

The enhancement of early career awards for investigators in the physical sciences will be important in maintaining our national pipeline of talent.

Support of high-risk, high-reward research projects pertinent to industry are designed to spur innovation.

Cross-disciplinary research is an important sector, and it is good to encourage collaboration between life sciences and the physical sciences.

As always, the NASA workforce is deserving of the Committee's support, especially when it comes to programs to strengthen that workforce.

Moreover, Mr. Chairman, the provisions in H.R. 5358 are likewise good ideas to enhance math and science education at all levels.

Programs such as the Robert Noyce Teacher Scholarship provide strong support to math and science teachers, particularly as they enter the final years of their training. Research has shown that these years are critical for retention of teachers, and so it is good to provide support at this critical point in their education.

Advanced degree programs for teachers such as those specified in the School and University Partnerships for Science and Math Education provision, are also important to keep educators on the cutting edge of their course material.

H.R. 5358 contains many creative provisions to support math and science teachers from the beginning of their training throughout their careers.

I believe this support is critical to enhancing students' views of math and science. Students need to see mentors who have passion for the subject material.

One particular concern of mine is regarding our nation's people of color. Minorities, with the exception of students at historically Black colleges and universities, are not pursuing careers in science, technology, engineering and math at the same rate of their peers.

My hope was to see a much greater emphasis on programs supporting ethnic minorities. Although I commend the efforts of the National Science Foundation, Department of Energy and other organizations that support research in the physical sciences, the problem is clearly far from being resolved.

This issue, of minority participation in math and science careers, is one I would like to see this committee address much more intently in the future.

As former Chair of the Research Subcommittee, I support this committee's efforts to enhance programs in the name of national competitiveness.

Thank you, Mr. Chairman. I yield back.

Chairman BOEHLERT. We will now consider H.R. 5356, the *Research for Competitiveness Act.* I recognize Mr. Gordon for his remarks.

Mr. GORDON. Mr. Chairman, I think we are moving along well.

Let me just say once again, I think this is a good bill. I think it would have been better if we had added the ARPA–E recommendations from the "Rising Above the Gathering Storm" bill that myself and most Members here have co-sponsored.

Just to, once again, remind people, so that it stays on your radar, so hopefully, we will have a chance to deal with this later, but the Department of Defense had a little agency called DARPA, and we are familiar with that. It is in the advanced research area. They developed the Internet. They developed stealth technology, and a number of other important technologies. What we would like to see, and again, following on the recommendations of the report, is that within the Department of Energy, we set up a similar type of advanced research agency, that we look around, you know, the country, and we determine the eight or ten, for them to determine the

eight or ten best technologies, where we could have some breakthrough with energy and alternative energies, that we bring the National Labs, the private sector, the universities together, really hunker down, focus on these, like they have done in DARPA, and see if we can't have some breakthroughs.

And again, I will not make it as an amendment, but I raise it as an issue, so that we can hopefully talk about this more at a later date.

[The prepared statement of Mr. Gordon follows:]

PREPARED STATEMENT OF REPRESENTATIVE BART GORDON

Today, the Committee will consider legislative proposals for improving the future competitiveness of the Nation.

The Manager's amendments to H.R. 5356 and H.R. 5358, which I have co-sponsored, meld provisions from the majority's bills and my bipartisan bills, H.R. 4434 and H.R. 4596.

I want to thank the Chairman and other Members of the Majority for working with me to improve both the scope and funding levels authorized in the manager's amendments so that they are more in-line with the recommendations of the recent report from the National Academy of Sciences, *Rising Above the Gathering Storm.*

The resulting legislation focuses specifically on improving science and math education and on strengthening basic research.

The markup vehicles now implement a number of the key recommendations of the *Gathering Storm* report, recommendations which represent a consensus for action from a distinguished panel representing business, academic, and education leaders.

Last year, I introduced three bills based on the *Rising Storm* panel's recommendations that were in the Science Committee's jurisdiction, and I had hoped to see early action by Congress in implementing them.

With the general uncertainty about our country's future economic prospects, we need to act promptly. At a recent ETS Subcommittee hearing with NIST's three Nobel Prize winners, all three agreed that we need to increase our investment in basic research and to improve K–12 science and math education.

The *Gathering Storm* report states that "laying the foundation for a scientifically literate workforce begins with developing outstanding K–12 teachers in science and mathematics."

I believe the report got it exactly right and has identified teachers as the first priority.

Therefore, I am pleased that the markup vehicle for H.R. 5358 will implement the top priority of the Academies' report, which is to put in place effective teacher training programs for new and in-service science and math teachers.

The proposed modifications to the Noyce scholarship program will transform it into much more than a scholarship program. It will spur reform to change the way colleges and universities educate new science and math teachers. Teachers who emerge from the program will combine deep knowledge of their subject with expertise in the most effective practices for teaching science or math.

The new teachers will also receive mentoring and support during the critical early years of their teaching careers, when teacher attrition is known to be high.

Finally, the program is authorized at a level that would enable it to meet the goal of producing 10,000 highly qualified science and math teachers each year within the President's goal of doubling the NSF budget.

In short, the manager's amendment now implements the highest priority of the *Rising Storm* report. In addition, the NSF's major K–12 education program involving partnerships between universities and school systems is strengthened by the manager's amendment. Emphasis is placed on professional development opportunities for practicing teachers, including support for Master's degree programs and teacher institutes.

While I am largely satisfied with these bills, I am disappointed that the Science Committee is being a follower and not a leader on the critical issue of innovation. We are following the action of Senate committees to move legislation, and the bills before us today were only recently introduced.

In addition, we are taking a timid approach by not addressing all of the *Gathering Storm* report's recommendations within the Committee's jurisdiction.

We are not taking up ARPA–E legislation to help meet the Nation's critical energy needs, and we are not authorizing the NSF and DOE Office of Science funding increases called for in both the President's American Competitiveness Initiative and

in the National Academy's report. As the authorizing committee for these agencies, we are ducking our responsibilities if we do not act.

So while the bills before us today are a good start, they do not represent a comprehensive approach. I hope the Committee will soon act to provide the missing pieces.

Mr. Chairman, I yield back my time.

Chairman BOEHLERT. Moving right along, we will now consider H.R. 5358, the *Science and Mathematics Education for Competitiveness Act.* I recognize Mr. Gordon for any remarks that he might care to make.

Mr. GORDON. Thank you, Mr. Chairman.

I will submit my eloquent remarks for the record, but I want to talk to the Committee just a moment about these bills that are coming up.

Once again, as usual, and I will start with the good news, I support the Chairman in these bills. I think they are good bills. We could, you know, I think maybe make them better, but these are good bills.

I am disappointed that we are getting started a little bit late with this. The authorizers are going to deal with this issue next week, and as a practical matter, we can—or rather, the appropriators—and we need to give them some instructions on this very important issue.

And now, what I would like to do, if I could, just for a minute or so, I would like to sort of declare a political free zone here. The California election is over. No one—well, I don't want to say no one, a couple of folks on the Committee have serious races, but really, most folks don't, and Dr. Schwarz, if it wouldn't hurt you, I would go down and endorse you in your primary. We don't have a new Member who has brought more to the Committee than you have, and I thank you for that.

Chairman BOEHLERT. Without objection, so ordered. Unanimous consent.

Mr. GORDON. Happy to do that. Would be happy to do that.

But you know, these are very important issues. You are probably tired of hearing me talk about my daughter, but my daughter is graduating from pre-K tomorrow, and I am very concerned, sincerely concerned, about the kind of competitiveness that she is going to, and her generation, is going to find when they enter the workforce. And you don't have to wait ten years or twelve years. It is going to be before that.

We really have, I think, a crisis brewing, and I don't want to, you know, I don't want to overdo it. In the '50s, we had Sputnik, that we thought, you know, was going to change the world, and that we were in trouble, and we were a great nation, and we came back together. In the seventies, once again, we thought we—this competitiveness was going to get us with the rising oil prices, but as a great nation, we came together. And I think that we have a chance to do that again, but this is a very serious problem, and we have a chance on the Science Committee, I think, to make a real contribution, but we need to do it right, and let me say that, and I will preface this, so you will know why.

President Clinton introduced something called direct lending, where he had student loans go directly through the Department of Education. I thought he was wrong. I thought the Department of

Education had more than they could handle, and that they would wind up screwing it up, and I fought him on that, and we have both programs, or at least we stopped them from taking the private sector out, and having just direct lending.

I say that because President Bush now is proposing, with much of this legislation, to run it through the Department of Education. That is a mistake, and this committee has over and over said it is a mistake. The Chairman and I are going to sign a letter to the appropriators saying that is a mistake, but we need to do more than just vote these things today, touch base, and go home.

We really need to work this with the appropriators, and we need to deal with this, because we have a lucky situation, in that there is going to be some additional funds that are going to be put in this competitiveness agenda, and it is going to be hard to go back and get these funds again later. We cannot screw this up, because they are going to say, well, you had your chance, and we are going to go somewhere else.

And let me tell you what I am talking about. Everybody that came before this committee that testified for us said that when it comes to science and education, it starts with teachers, and that is what we have got to deal with. Everyone except for the Secretary of Education, and again, she had a parochial interest, and she seems to be doing better than most of them have done. But everybody else says it starts with the teacher.

Yet, the President's proposal puts 70 percent of the money into math curriculum, nothing for science, only math curriculum, and then, the other 30 percent goes into AP courses. Well, you can't have AP courses if you don't have AP teachers, and so, it is very important, I think, that we talk with the appropriators, and get this thing right. If we follow along the route that he is proposing, it is contrary to everything that this committee has done over the last few years on a bipartisan basis.

At the same time they are putting the money in the Department of Education for this curriculum, the National Science Foundation, that for fifty years, has been trying to educate teachers, and doing a good job, they are being cut by 50 percent over this last three years. And so, this is not a partisan issue. This is, you know, a Science Committee, this is a competitiveness issue, and we really need to take this opportunity to do more than vote for this bill and then go home. We need to talk with the appropriators. We need to get this thing right, and I hope that we can do that again.

I know that the Chairman and I will be signing a letter, but we need to do more than that, and I hope that all of you will take the chance to talk with the appropriators, and explain that we want to do this thing the right way. It is not a partisan issue. It is an issue about competitiveness for this country, and we need to get it right.

And thank you, Mr. Chairman.

Chairman BOEHLERT. Thank you, Mr. Gordon.

I thank you for your passion, for your commitment, and I thank you for saying, suggesting at the outset that this be a nonpartisan zone, and we just concentrate on what is best for the Nation and our future.

And I just signed the letter you are referring to, but let me tell you something. Bart Gordon and I, as partners on the Science

Committee, do more than just sign letters. We have been working right along with the appropriators. We don't have to pass some bill here today to initiate action, in terms of dealing with the appropriators. We have been dealing with them right along, not just last week, not just last month, not just last year, but for several years. Together, we have gone to them. Individually, we have gone to them. And we have focused on the importance of science and math education for the future of this nation, and we have said, quite frankly, if you leave it just to the professionals in the Department of Education, shame on you.

The National Science Foundation has a vital role to play, and we have emphasized that role, and when there was an effort to take away the Science and Math Partnership from the National Science Foundation, the response they got from this committee, on a bipartisan basis, was quite simple. Like hell. We wouldn't stand for it, and they didn't do it.

So, it didn't take a report from the National Academy of Science, an excellent report, entitled "Rising Above the Gathering Storm," to get our collective attention within this room. We have been on this subject for some time, but that aided us in getting the attention of others, who don't have a day to day responsibility in this subject arena. And now, when we talk to them, when Mr. Gordon talks to his people, when I talk to our people, when we interact with each other, we are now getting people who are paying attention to this very important subject.

So, I couldn't appreciate more the sentiment behind Mr. Gordon's remarks. And quite honestly, I couldn't appreciate more the determined effort that he has demonstrated to let partisanship check it at the door. I have decided not to run for re-election. I came here 42 years ago as a starry-eyed young staffer. It is time for me to go. But one of the reasons that I used in the makeup of my decision was partisanship has reared its ugly head on Capitol Hill for too long, too consistently, and tolerance for another point of view has been notably absent. Fortunately, that is not in this committee, so I thank you very much.

Now, we will consider the bill. I ask unanimous consent that the bill is considered as read and open to amendment at any point, and that the Members proceed with the amendments in the order of the roster. Without objection, so ordered.

The first amendment on the roster is an amendment offered in the nature of a substitute by the very distinguished gentleman from Michigan, who is enjoying bipartisan support on this committee today, Dr. Schwarz. I ask unanimous consent that the amendment in the nature of a substitute be treated as original text for purposes of amendment under the five minute rule, and without objection, that is so ordered.

The Clerk will report.

The CLERK. Amendment to H.R. 5358, offered by Mr. Schwarz of Michigan.

Chairman BOEHLERT. Ask unanimous consent to dispense with the reading of the full amendment. Without objection, so ordered.

I recognize Dr. Schwarz for five minutes.

Mr. SCHWARZ. Mr. Chairman, I am pleased to introduce this amendment in the nature of a substitute, which is the end result

of many hours of hard work on the part of Members and staff on both sides of the aisle. I especially want to thank Chairman Boehlert, Ranking Member Gordon, Dr. Ehlers, Mr. Green, Mr. Honda, Ms. Jackson Lee, and Mr. Baird and their staff, for their hard work and thoughtful comments, that have contributed to the many improvements in this amendment. Like the original bill, this substitute represents a critical step for our country's education system in science, mathematics, engineering, and other technology.

This substitute includes nearly all the language from the original bill, while bringing in many provisions suggested by Democratic and Republican Members of the Committee. I am proud to say that working together, we have drafted legislation that creates no new programs, but rather, strengthens and expands existing programs that have a proven track record of success.

This substitute bolsters important programs dedicated to preparing science, technology, engineering, and math teachers, originally authorized in the *National Science Foundation Authorization Act of 2002.*

It expands the Robert Noyce Scholarship program. Robert Noyce was the founder of Fairchild Semiconductor, one of the founders of Intel, and one of the discoverers of the integrated circuit or microchip. He died in 1990. It expands the Noyce Scholarship program to include four years of instruction and field work opportunities for participants, which will help attract science, math, technology, and engineering majors to consider teaching careers early on. It also prioritizes programs focusing on teacher training, including preparation for teaching advanced placement courses, and developing Master's degrees programs under the School and University Partnerships for Science and Mathematics Education program, formerly known as Math and Science Partnerships program. The substitute also authorizes enrichment activities such as summer camps and classroom laboratory experiences to better engage students in science, math, technology, and engineering fields.

Undergraduate programs also receive additional attention in this substitute. It combines the new Centers for Undergraduate Education into the pre-existing Science, Technology, Engineering, and Mathematic Talent Expansion program at the NSF, furthering that program's goal of increasing the pool of undergraduate students pursuing science, math, technology, and engineering degrees. It also requires the continuation of existing undergraduate education programs at the Foundation.

The substitute clarifies a few items in the original bill, in the 2002 Act. It reasserts the importance of the Centers for Research and Learning and Education Improvement established in the 2002 Act. It also clarifies that the section on Department of Energy education programs in the original bill refers only to programs within that Department's Office of Science.

Finally, on the request of Members of both sides of the aisle, this substitute strengthens the assessment of programs in order to ensure that the National Science Foundation is maintaining its historically strong standards of excellence for the programs and its funds. The substitute requires the Foundation to assess its programs in a way that allows for comparisons to other federal programs, aiding both the Foundation and other agencies in the design

and implementation of education programs that expand science technology, engineering, and math education programs, and opportunities for students at all levels.

And with that, Mr. Chairman, I yield back.

[The prepared statement of Mr. Schwarz follows:]

PREPARED STATEMENT OF REPRESENTATIVE JOHN J.H. SCHWARZ

I am pleased to introduce this amendment in the nature of a substitute, which is the end result of many hours of hard work on the part of Members and staff on both sides of the aisle. I especially want to thank Chairman Boehlert, Ranking Member Gordon, Chairman Ehlers, Mr. Green, Mr. Honda, Ms. Jackson Lee, and Mr. Baird and their staff for their hard work and thoughtful comments that have contributed to the many improvements in this amendment. Like the original bill, this substitute represents a critical step for our country's education system in science, mathematics, engineering, and other technology.

This substitute includes nearly all the language from the original bill, while bringing in many provisions suggested by Democratic and Republican Members of the Committee. I am proud to say that, working together, we have drafted legislation that creates no new programs but, rather, strengthens and expands existing programs that have a proven track record of success.

This substitute bolsters important programs dedicated to preparing science, technology, engineering, and math teachers originally authorized in the *National Science Foundation Authorization Act of 2002.* It expands the Robert Noyce Scholarship program to include four years of instruction and field work opportunities for participants, which will help attract science, math, technology, and engineering majors to consider teaching careers early on. Robert Noyce was co-founder of Fairchild Semiconductor and Intel, and he is credited as one of the inventors of the integrated circuit or microchip. He died in 1990. It also prioritizes programs focusing on teacher training, including preparation for teaching advanced placement courses and developing Master's degrees programs under the School and University Partnerships for Science and Mathematics Education program, formerly known as the Math and Science Partnerships program. The substitute also authorizes enrichment activities, such as summer camps and classroom laboratory experiences, to better engage students in science, math, technology, and engineering fields.

Undergraduate programs also receive additional attention in this substitute. It combines the new centers for undergraduate education into the preexisting Science, Technology, Engineering, and Mathematic Talent Expansion Program at the National Science Foundation, furthering that program's goal of increasing the pool of undergraduate students pursuing science, math, technology, and engineering degrees. It also requires the continuation of existing undergraduate education programs at the Foundation.

The substitute also clarifies a few items in the original bill and the 2002 Act. It reasserts the importance of the Centers for Research on Learning and Education Improvement established in the 2002 Act. It also clarifies that the section on Department of Energy education programs in the original bill refers only to programs within the Office of Science.

Finally, on the request of Members from both sides of the aisle, this substitute strengthens the assessment of programs in order to ensure that the National Science Foundation is maintaining its historically strong standards of excellence for the programs it funds. The substitute requires the Foundation to assess its programs in a way that allows for comparisons to other federal programs, aiding both the Foundation and other agencies in the design and implementation of education programs that expand science, technology, engineering, and math educational opportunities for students at all levels.

Chairman BOEHLERT. Thank you very much, Dr. Schwarz, for that excellent summation. Is there anyone else who would care to speak on this?

Mr. Honda.

Mr. HONDA. Thank you, Mr. Chair, and thank you for recognizing me, and I will be brief.

I just wanted to take this opportunity to thank you and your staff for working with me to include language about what I have been calling teaching innovation in the manager's amendment. The

language would allow NSF to use funding for the development and dissemination of curriculum materials that will help foster inventiveness and innovation, and to research the process of innovation, and the teaching of inventiveness.

I think, then, as we strive to train new scientists, engineers, and teachers to maintain global competitiveness in science and technology, we must realize that we cannot just train them in the same old way we have used in the past. We need to introduce them to new fields, teach them to be interdisciplinary, and ensure that they are taught the creativity and technical skills of highly inventive and innovative people.

Data on patent awards shows that in especially innovative, high-tech companies, the cutting edge work has really been driven by a few highly innovative scientists and engineers. We need to figure out how these people do it, and teach others those skills, and that is what my language does. I am not the only one who thinks this. Leading experts made similar recommendations in the MIT–Lemelson program report called Invention, and many high-tech CEOs have told me the same thing, and have endorsed my stand-alone bill, from which this language is adapted, the *Inventive Act of 2006* and H.R. 5477.

So, again, Mr. Chairman, I thank you for working with my staff and myself to include this in the manager's amendment, and for putting these bills together that we can support, and I want to also thank you for your last comment, and really personally recognize you for your great leadership in the years that I have been here.

And I yield back.

[The prepared statement of Mr. Honda follows:]

PREPARED STATEMENT OF REPRESENTATIVE MICHAEL M. HONDA

Mr. Chairman, thank you for recognizing me, and I'll be brief.

I just wanted to take this opportunity to thank you and your staff for working with me to include language about what I've been calling "teaching innovation" in the manager's amendment.

The language would allow NSF to use funding for the development and dissemination of curriculum materials that will help foster inventiveness and innovation, and to research the process of innovation and the teaching of inventiveness.

I think that as we strive to train new scientists, engineers, and teachers to maintain global competitiveness in science and technology, we must realize that we cannot just train them in the same old way we have used in the past.

We need to introduce them to new fields, teach them to be interdisciplinary, and ensure that they are taught the creativity and thinking skills of highly inventive and innovative people.

Data on patent awards shows that in especially innovative high-tech companies, the cutting edge work has really been driven by a few highly innovative scientists and engineers. We need to figure out how these people "do it" and teach others those skills. That's what my language does.

I'm not the only one who thinks this—leading experts made similar recommendations in the MIT–Lemelson Program report "Invention," and many high-tech CEOs have told me the same thing and have endorsed my stand-alone bill from which this language is adapted, the INVENT Act, H.R. 5477.

So again, I thank the Chairman for working with me to include this in the manager's amendment, and I yield back the balance of my time.

Chairman BOEHLERT. Thank you very much. I really appreciate those comments. Mr. Rohrabacher.

Mr. ROHRABACHER. Thank you, Mr. Chairman.

And while I hate to be the skunk at the lawn party again, I will have to oppose this love feast of bipartisanship, both on philosophical and practical grounds.

Mr. Chairman, let me just note that the goal of having better and more science and mathematics teachers, as far as I am concerned, is a noble goal, and I want to make sure the Chairman—make sure I am addressing the Chairman.

Chairman BOEHLERT. The Chairman is always attentive to the distinguished gentleman from California.

Mr. ROHRABACHER. Thank you, Mr. Chairman.

As I was saying, the goal of achieving more math and science teachers is certainly a laudable goal. I would have to say that whether that goal should be the priority for all of our local schools throughout the United States is something they should decide, and I have just spent the morning talking to educators from my district who are totally upset with the outcome of the No Child Left Behind Program. The No Child Left Behind Program was also something that sounded very laudatory, and ended up with more direction from Washington, D.C. about education and what was going on in the local area, and they are bemoaning that control and that loss of leeway that they have, and the loss of control that they have had locally because of the No Child Left Behind program.

This will, again, further the—set things in a direction we would like to see it, but perhaps that is not their priority, and perhaps there are other ways to achieve this goal, if it is their priority. This would offer a certain expenditure of federal money, and I certainly laud the fact that the scholarship program within this bill demands a two for one service requirement for each person who gets a scholarship.

Chairman BOEHLERT. Would the gentleman yield?

Mr. ROHRABACHER. Yes, I would.

Chairman BOEHLERT. I couldn't agree more that the local schools should decide whether or not they want to hire a capable science teacher. That is their decision to make. What we want to make sure is they have some choices in the marketplace, and that capable science teachers are trained, and we have found that offering these incentives to students going to college majoring in science, math, and engineering, serve as a vehicle to carry them from college, without heavy loan obligation, into the classroom, teaching our youngsters. That is what we want.

Mr. ROHRABACHER. Reclaiming my time. Just to note, there are ways to do this through the marketplace, without necessarily having a federal program directed by bureaucrats, whether they are at the Department of Education, or whether they are at NASA, or whether at the National Science Foundation. I don't care where the public employees are, where their desk is located. They are still parts of a Washington bureaucracy that will eventually have the same type of attitude that Washington bureaucrats have towards local educators in the No Child Left Behind program.

The way that local schools can attract, through the marketplace, as many science and mathematics teachers as are necessary to meet their standards is very easy, and it won't cost any money, in terms of any more money. It is just simply permitting science and mathematics teachers to receive higher compensation from their

pay, for their pay, than do people who teach basket-weaving and physical education. But that is not the case in so many schools throughout the country, where we have highly structured, and I might say a union environment, which actually undermines the teaching of educational courses that we now know are necessary for our country in science and mathematics. No one wants to touch that issue, because we know those unions who are demanding that basket-weaving teachers earn the same as mathematics teachers and science teachers, have a great sway politically, and that is unfortunately one of the issues we can't handle here in this building.

But what we can do is make sure that we just don't substitute government control from Washington, D.C., and direction from Washington, D.C., for an inability of people to try to handle those issues locally. For example, summer schools may—and summer camps may be a very good thing. This should not be a decision made, something that we try to pressure people to do from the Federal Government. This should be made—a decision made totally by local people.

Furthermore, what I find in this bill is—basically, it is aimed at teachers. That is correct, and as I say, I think there are plenty of trained mathematicians and scientists who will go in that direction of teaching, if they were offered higher pay, but it doesn't really do anything, in terms directly for the students. There are, for example, many members of the scientific and engineering organizations who would love to share enthusiasm and their knowledge for math and science and engineering to kids in K–12, and that is where we really need to make our mark. We need to make sure that younger people who get interested in science and mathematics, that is where our future depends on, and there is nothing in this that affects those kids. What it affects are teachers, and what we are going to do is get away—we are going to teach teachers, rather than attracting those people who already have the skills in, because we are not willing to look at that union issue, as I suggested.

I would, again, suggest to my friends and colleagues that although this is very laudable, this is a very, very laudable goal, education is something our country depends upon, certainly science and mathematics education, but just like the No Child Left Behind, there is no excuse for us to be expanding the arena of the Federal Government into the decisions of local education. After all, the money all comes from the local area anyway. We are just taxing the money away, and giving it back as we think it should be structured. That doesn't make any sense to me, and I will oppose the bill, although I applaud all of you for your very good motives.

Chairman BOEHLERT. We thank the gentleman for his applause for the noble objectives of this very worthy bill, and we thank him for his always interesting observations with his intervention.

And now, any further comments?

Mr. GORDON. Well, I will just real quickly ask to strike the last word.

Chairman BOEHLERT. The gentleman is recognized.

Mr. GORDON. As usual, my friend from California has an opinion, and whether you agree with the opinion or not agree with the opinion, it really is not on mark with this bill.

I mean, I think what we are trying to accomplish—what he wants to accomplish, you know, God bless him, go forward and try to do what you can where you can, but that is not what this bill is about. The fact of the matter is that, if you want to say the private sector has not worked in this area—right now, two-thirds, approximately two-thirds of the math and science teachers in this country have neither a major or a certificate to teach that subject, and that has been isolated as the number one problem. It is hard to inspire someone, it is hard to teach someone, if you don't fully understand, you know, the subject.

This gives us an opportunity to put more of those teachers with that background in the market, so that those communities can bring them in, and probably even more importantly, what it will do is, it will go to those existing teachers, allow them to upgrade their credentials. So, again, the problems, concerns that you mention, you are consistent in mentioning them, but it is inconsistent with this particular bill.

Chairman BOEHLERT. Thank you very much, Mr. Gordon. Is there any further discussion on that?

Mr. GREEN. Yes, Mr. Chairman.

Chairman BOEHLERT. Who seeks recognition? Mr. Green.

Mr. GREEN. Yes, Mr. Chairman. I move to strike the last word.

Chairman BOEHLERT. The gentleman is recognized.

Mr. GREEN. Thank you, Mr. Chairman. Mr. Chairman, first, I would like to thank you and the Ranking Member, for your leadership on this most important piece of legislation, to implement many of the Augustine recommendations for global competitiveness.

I would like to thank all of the staff persons who have worked tirelessly to draft this legislation. It is most meaningful, and I believe that this amendment will do a lot to clarify some of our positions. Most especially, I would like to commend this committee's spirit of bipartisanship, notwithstanding recent comments, and the efforts put forth to accommodate my interests in providing additional opportunities for under-represented persons in math and in science.

Following last month's hearing regarding the National Science Foundation's role in providing math and science education, I introduced H.R. 5458. This legislation authorizes a National Science Foundation Competitive Grant program, which would assist institutions of learning and other science and math-oriented nonprofit organizations, with the creation and/or expansion of science and math summer camps specifically targeted towards inner city, underprivileged children. Although the text provided in the substitute amendment does not contain all of the language that I included in H.R. 5458, I appreciate the spirit of the compromise provision, which authorizes the development of educational programs and materials for use to conduct both after-school and summer camp enrichment programs in math and science for under-represented students.

I also want to commend the Chair and Ranking Member for their efforts to include several additional provisions other than my own, which aim to increase the diversity among the STEM professions. Some of the progressive provisions included are the National Science Foundation, the NSF, must consider academic merit, finan-

cial need, and the promotion of participation by women, minorities, and individuals with disabilities in awarding the Noyce Scholarships. I think that is progress. STEM professionals who receive a stipend to become certified as teachers must carry out their teaching payback period in high need schools. I believe that is progress. The teaching payback period for scholarship recipients is reduced by one year if they elect to teach in a high need school. I think that is progress.

The NSF must consider the extent to which activities proposed will encourage the interests of women, minorities, and individuals with disabilities in STEM fields. I believe that is progress. The NSF must give priority to applications from partnerships that include a high need local education agency in making awards. That is progress. Under the STEM Talent Expansion program, proposed language specifically states that NSF must strive to increase the number of STEM graduates who are women, minorities, and individuals with disabilities. This is progress.

Mr. Chairman, when Albert Einstein was a child, he was considered a slow learner, not the genius destined for greatness that he is remembered as today. This legislation gives us a greater chance, not only to leave no child behind, but also to reveal the hidden talents of the next genius child waiting to make a difference if given the opportunity.

I thank the Chairman and Ranking Member for the hard work and leadership that they have given us, in helping us to move forward with the Augustine recommendations to improve our STEM endeavors. And——

Mr. GORDON. Will the gentleman yield?

Mr. GREEN.—my colleagues will—yes, I yield.

Mr. GORDON. Let me just quickly say that I appreciate you bringing these issues before us, and that I am pleased that the Chairman accepted them into this bill. Every witness that came before us, it was consistent that to improve our competitiveness, we had to improve our math and science skills, and everyone said that women and minorities were under-represented, and the best way to get bang for your buck was to work in those areas, and I think that your amendments are going to help us have a better bill, and a more competitive nation. Thank you.

Mr. GREEN. I reclaim my time, Mr. Chairman, and would close by simply saying I greatly appreciate the bipartisan effort that was put forth, Mr. Chairman, and I look forward to continuing this type of effort.

I came here to work with everybody, and I appreciate it when the hand of friendship is extended so that we can work together, and I thank you.

I yield back.

Chairman BOEHLERT. Thank you very much, Mr. Green.

The Chair recognizes Ms. Matsui for—are you ready to proceed with your amendment? The Clerk will read the amendment.

The CLERK. Amendment to H.R. 5358, offered by Ms. Matsui of California.

Chairman BOEHLERT. Without objection, I ask unanimous consent to dispense with the reading. Without objection, so ordered.

The gentlelady is recognized for five minutes to explain her amendment.

Ms. MATSUI. Thank you, Mr. Chairman and Ranking Member Gordon, for your leadership on this issue that is so important to our nation's future. It is a pleasure to consider these critical challenges on my first markup today.

Upgrading the math and science capabilities of our students, teachers, schools, and colleges has long been a priority for me. I am glad to be on the Committee to participate in the support and debate. The redesigned and expanded Noyce Teacher's Scholarship program contained in this bill is intended to create thousands of new math and science teachers each year.

My amendment directs NSF to report to Congress on how many of those teachers are staying in the profession beyond the service commitment required by the Noyce program. I believe this is a logical question to ask, particularly since teacher retention is one of the program's objectives. This provision will allow Congress and this committee to have measurable results, so that we can go back to our constituents and say this was money well spent, because to maintain our leadership in math and science, we need teachers who devote their professional career to teaching these subjects, not just a few years out of college.

This amendment will allow us to see how successful these programs are in producing such truly committed individuals. I hope my colleagues will be able to support this amendment, and thank you very much.

I yield back the balance of my time.

Chairman BOEHLERT. I want to thank Ms. Matsui for her amendment. Didn't take you long to get actively engaged. I mean, just a couple of months on the Committee, and already, you are coming forward with something that demands our thoughtful consideration. The Chair has given it just that, and he is pleased to support the amendment.

Is there any further discussion on the amendment? If no, the answer—the vote occurs on the amendment. All in favor, say aye. Aye. Opposed, no. The ayes have it, and the amendment is agreed to.

The third amendment on the roster is offered by the gentlelady from Texas, Ms. Johnson. Are you ready to proceed with your amendment?

Ms. JOHNSON. Yes.

Chairman BOEHLERT. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 5358, offered by Ms. Johnson of Texas.

Chairman BOEHLERT. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

The gentlelady is recognized for five minutes to explain the amendment.

Ms. JOHNSON. Thank you very much, Mr. Chairman, and our Ranking Member.

Increasing our national competitiveness begins in the classroom. In order to educate, train, and produce a generation of scientists, technologists, engineers, and mathematicians, we have to start early. Students must be shown from a young age that science and

math are a fun. An important part of having a meaningful educational experience is access to resources.

Science and math classrooms are not as fun, unless those classrooms are well equipped to capture kids' imaginations. Microscopes, computers, projectors, animals for dissection are all key items that link math and science education to students' sense of practicality. Kids need to see how these subjects apply to everyday life. That vision often begins in the high school laboratory.

Mr. Chairman, my colleague, Rubén Hinojosa, has developed a clever strategy to get science laboratory equipment to high schools, and I must tell you that we explored other committees. The fundamental aspect of that provision has been formed into a proposal for a demonstration grant that is before the Committee's consideration. The amendment targets secondary schools in high need areas. This definition refers to schools located in impoverished areas, rural, urban, and suburban. High schools may apply for grants through the National Science Foundation to enhance their math and science labs.

Applicants must demonstrate a partnership with a university, industry, or a nonprofit organization, a national laboratory, or another entity. The provision, totaling a mere $3 million for up to ten such partnerships is meant as a demonstration project. I will note that the partners must agree to pay two thirds of the total cost for each grant proposal, while the National Science Foundation will pay one third of the cost. Universities, colleges, technology companies, and other scientific and engineering groups are rich with opportunities. This amendment provides a mechanism for schools to reach out for those opportunities, and form partnerships in the community. The ultimate goal, of course, is to open lines of communication between these partners, and enhance our math and science classrooms. Only there can the hearts of future scientists, technologists, engineers, and mathematicians be captivated.

Mr. Chairman, I know that you object to this for two reasons. One, you felt like this was the wrong venue. Two, it was submitted late, and you are right. Fourteen years I have been on this committee, and my story has been the same, to try to make sure that we are competitive in the future, by making sure that all of our young people have an opportunity to prepare for it.

Congresswoman Connie Morella and I sponsored legislation and created a national advisory group to attempt to attract more minorities and women to the field, and we had very esteemed people from around the country. The Chair was from my district, the President of TXU, that was very interested in what we were doing. We know there is a need, and the need is great. This was late coming, because we explored other areas, and I have heard the same reason for not putting it in the Department of Education as I have heard here earlier.

What I want to say, Mr. Chairman. I am not going to ask for a vote. This is supported bipartisanly. I am going to pull the amendment down, and ask you to help us get some attention in this area, perhaps even in conference.

Mr. Chairman, it has come the time when we have got to focus on where the needs are, to get these young people prepared for the

future. This is not a lot of money, and I believe that it will be useful.

[The prepared statement of Ms. Johnson follows:]

PREPARED STATEMENT OF REPRESENTATIVE EDDIE BERNICE JOHNSON

Thank you, Mr. Chairman and Ranking Member.

Increasing our national competitiveness begins in the classroom. In order to educate, train, and produce a generation of scientists, technologists, engineers and mathematicians, we must start early.

Students must be shown, from a young age, that science and math are fun. An important part of having a meaningful education experience is access to resources.

Science and math classrooms are not very fun unless those classrooms are well-equipped to captivate kids' imaginations. Microscopes, computers, projectors, animals for dissection are all key items that link math and science education to students' sense of practicality.

Kids need to see how these subjects apply to everyday life. That vision often begins in the high school laboratory.

Mr. Chairman, my colleague, Rubén Hinojosa, has developed a provision to get science laboratory equipment into high school classrooms. The fundamental aspects of that provision have been formed into a proposal for a demonstration grant that is before the Committee's consideration.

The amendment targets secondary schools in "high need" areas. This definition refers schools located in impoverished areas—rural, urban or suburban.

High schools may apply for grants, through National Science Foundation, to enhance their math and science labs. Applicants must demonstrate a partnership with a university and industry, nonprofit organization, national laboratory, or other entity.

The provision, totaling a mere $3 million for up to ten such partnerships, is meant as a demonstration project. I will note that the partners must agree to pay two-thirds of the total cost for each grant proposal, while the National Science Foundation would pay one-third.

Universities, colleges, technology companies, and other scientific and engineering groups are rich with opportunities. This amendment provides a mechanism for schools to reach out for these opportunities.

The ultimate goal is to open the lines of communication between these partners and enhance our math and science classrooms. Only there can the hearts of future scientists, technologists, engineers and mathematicians be captivated.

Mr. Chairman, I will note the letter sent by Congressman Reyes and over fifty other Members of Congress requesting a greater emphasis on women and under-represented minorities in science.

My amendment is also supported by the American Chemical Society, the National Science Teachers Association and the American Council on Education. All have sent you letters in the name of this cause.

Thank you, Mr. Chairman, for the opportunity to speak on this amendment. I yield back.

Chairman BOEHLERT. I want to thank the gentlelady for raising the issue, and she performs a very valuable service for us all by almost forcing us to pay attention to the subject at hand.

There is a compelling need, and I will be glad to work with the gentlelady in trying to find the best way to address that need, and I won't just slough it off, but I don't think, in my heart of hearts, that the National Science Foundation is the appropriate vehicle to carry forward this program. They have got a lot on their plate, and they do it exceptionally well. One thing that we don't want to add to it is getting into a grant program like this, where that is not really their forte.

But that doesn't eliminate the need that you have so correctly identified, so I will be glad to work with the gentlelady in partnership, as we try to find some vehicle to carry forward with what we both agree needs to be carried forward.

And is the gentlelady asking for unanimous consent to withdraw her amendment?

Ms. JOHNSON. Yes, I ask for unanimous consent to withdraw it, and to say, Mr. Chairman, that the National Foundation is probably the only source of scientific money in the government that has not been challenged for how they use it.

Chairman BOEHLERT. I thank the gentlelady.

Ms. JOHNSON. And whether they use it effectively.

Chairman BOEHLERT. Without objection, her unanimous consent request is so ordered.

Ms. JOHNSON. Thank you, Mr. Chairman.

Chairman BOEHLERT. Ms. Biggert, do you seek the Chair's attention?

Ms. BIGGERT. Yes, Mr. Chairman. I move to strike the last word.

Chairman BOEHLERT. Well, you have the Chair's attention.

Ms. BIGGERT. Thank you.

Chairman BOEHLERT. And you are recognized.

Ms. BIGGERT. Thank you. Mr. Chairman, I would just like to ask that a statement be submitted for the record, and it is about adding section 12, and thanking you for the opportunity to have that in the bill. And I yield back.

[The prepared statement of Ms. Biggert follows:]

PREPARED STATEMENT OF REPRESENTATIVE JUDY BIGGERT

Thank you Mr. Chairman.

I want to take this opportunity to thank you and Mr. Schwarz for working with me on a provision that is now Section 12 of this bill.

This section would require the NSF, when evaluating the educational programs created in this bill, to use assessment methods that would allow the effectiveness of these programs to be compared to the effectiveness of science, math, and engineering education programs supported by other federal agencies.

As part of the Deficit Reduction Act, Congress created an Academic Competitiveness Council. Chaired by the Secretary of Education and consisting of officials from other federal agencies responsible for managing programs to promote math and science, the Council is charged with identifying all such programs and determining their effectiveness. More specifically, the Council is charged with identifying areas where programs overlapped or are duplicative, and was asked to recommend ways to efficiently integrate and coordinate such programs.

A major purpose of this Council is to develop a "measuring stick" that can be used to evaluate programs that promote math and science education across the federal agencies.

As a Member of the Education and Workforce Committee, I attended a hearing at the beginning of May at which the Assistant Secretary of Education for Planning, Evaluation, and Policy Development provided an update on the development of this "measuring stick."

Granted, it's not yet complete.

And once it is complete, the Science Committee and the Education and Workforce Committee should examine it closely to ensure that it is an appropriate evaluation tool and accomplishes what Congress intended.

For this committee to effectively exercise its oversight responsibilities, we need to be able to compare programs across agencies.

That's why this provision is just plain common sense, and I thank the Chairman and Mr. Schwarz, the bill sponsor, for including it in the substitute.

I yield back the balance of my time.

Chairman BOEHLERT. Without objection, so ordered.

Are there any other amendments to the substitute? Dr. Ehlers.

Mr. EHLERS. Mr. Chairman, I strike the last word.

Chairman BOEHLERT. The gentleman is recognized.

Mr. EHLERS. I want to speak to the general issue. I will not be offering an amendment, but I certainly want to thank you, Mr. Chairman, for your work on this.

As you know, I spent the better part of twenty years of my professional career working on this, and my entire Congressional career working on improving math and science education, and I deeply appreciate your efforts, and those of Dr. Schwarz, in putting this bill together, and presenting it to us. It is a big step forward, and certainly is in accord with the President's American Competitiveness Initiative, but not only that, it is good for the kids, and something that is very badly needed, and I just wanted to thank you and everyone else on this committee involved with that, and particularly, Dr. Schwarz, who has been—whom I served with in the Michigan Senate. He did yeoman work there. He is continuing to do yeoman work here, and I deeply appreciate your efforts.

Thank you very much. I yield back the balance of my time.

Chairman BOEHLERT. I thank the gentleman. Who seeks recognition? Mr. Costa.

Mr. COSTA. Yes, I move to strike the last word, Mr. Chairman. I don't have an amendment on the measure, but I do want to comment on the effort.

I do concur with my colleagues, to commend you and their efforts, and our Ranking Member, to develop, and continue the bipartisan tradition, which I think is very important as legislators, to do the work that we are sent here to do.

The problem that Congressman Schwarz and others are trying to address, I think, is laudable here. My own experiences in schools in the Central Valley of California is to take advantage of the funds that have been made available, and the desire to train science and math teachers fund that we obviously have to refocus our efforts on.

Part of the problem, I think, has touched upon the point that you have raised as to the letter that you are going to provide to the appropriators, the authorization, very, I think, helpful in expanding and enhancing the efforts, but frankly, what we have found in our area of California is that the grants tend to be too small, and limited in number, in terms of getting to where it is most needed. And frankly, I applaud the fact that you are both going to send the letter to the appropriators. I am not so sure that frankly, the whole committee, or those who are in concurrence, should be signing a letter to the appropriators, because unless we are able to get this money where it is most needed, I am afraid that the effort that we would like to—the ultimate results we would like to see achieved will be lacking.

So, I concur with measure. I intend to support it, but I do think that the goal really is to make sure that the appropriators understand the seriousness of the effort.

I yield the balance of my time.

Chairman BOEHLERT. I thank the gentleman for that.

If there are no other amendments, the vote occurs on the amendment in the nature of a substitute. All in favor, say aye. Aye. The nos, no. The yeas have it, and the amendment is agreed to.

Are there any other amendments? Hearing none, the vote is on the bill, H.R. 5358, the *Science and Mathematics Education for Competitiveness Act,* as amended. All those in favor, say aye. Aye. Opposed, no. In the opinion of the Chair, the ayes have it.

I recognize Mr. Gordon to offer an amendment.

Mr. GORDON. Mr. Chairman, I move that the Committee favorably report H.R. 5358, as amended, to the 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 question is on the motion to report the bill, as amended, favorably.

Those in favor of the motion will signify by saying aye. Aye. Opposed, no. The ayes have it, and the bill is favorably reported.

Without objection, the motion to reconsider is laid upon the table.

Mr. GORDON. Mr. Chairman, may I note that this was—well, it wasn't unanimous, but it was all but one voted for this, so that as we talk to the appropriators, we could say——

Mr. ROHRABACHER. You could move to make it unanimous, and I wouldn't object.

Mr. GORDON. Well, then, I will move to make this unanimous.

Chairman BOEHLERT. All in favor, say aye. Aye. No, aye. The gentleman's motion has passed. The spirit of cooperation.

I move that Members have two subsequent calendar days in which to submit supplemental, minority, or additional views on the measure. I move, pursuant to Clause 1 of Rule 22 of the Rules of the House of Representatives that the Committee authorize the Chairman to offer such motions as may be necessary in the House to adopt and pass H.R. 5358, the *Science and Mathematics Education for Competitiveness Act,* as amended. Without objection, so ordered.

I want to thank all the Members for their attendance, not just today, but for their active participation in the important deliberations of this committee.

This concludes our markup.

[Whereupon, at 3:53 p.m., the Committee was adjourned.]

Appendix:

H.R 5358, Section-by-Section Summary, Amendment Roster

I

109TH CONGRESS
2D SESSION

H. R. 5358

To authorize programs relating to science, mathematics, engineering, and technology education at the National Science Foundation and the Department of Energy Office of Science, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

MAY 11, 2006

Mr. SCHWARZ of Michigan (for himself, Mr. BOEHLERT, Mr. SMITH of Texas, Mr. CALVERT, Mr. EHLERS, Mrs. BIGGERT, Mr. INGLIS of South Carolina, and Mr. MCCAUL of Texas) introduced the following bill; which was referred to the Committee on Science

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A BILL

To authorize programs relating to science, mathematics, engineering, and technology education at the National Science Foundation and the Department of Energy Office of Science, 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 "Science and Mathematics Education for Competitiveness Act".

SEC. 2. ROBERT NOYCE TEACHER SCHOLARSHIP PROGRAM.

Section 10 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n–1) is amended—

(1) by inserting ''Teacher'' after ''Noyce'' in the section heading and each place it appears in the text;

(2) in subsection (c)(3)—

(A) by striking ''$7,500'' and inserting ''$10,000''; and

(B) by striking ''of scholarship support'' and inserting ''of scholarship support, unless the Director establishes a policy by which part-time students may receive additional years of support'';

(3) in subsection (c)(4), by inserting ''with a maximum service requirement of 4 years'' after ''was received'';

(4) in subsection (d)(3), by striking ''1 year'' and inserting ''16 months'';

(5) in subsection (d)(4), by striking ''for each year a stipend was received'';

(6) in subsection (g)(2)(A)—

(A) by striking "Treasurer of the United States," and inserting "Treasurer of the United States."; and

(B) by striking "multiplied by 2."

(7) in subsection (i)(3), by inserting "or had a career in" after "is working in"; and

(8) by adding at the end the following:

"(j) AUTHORIZATION OF APPROPRIATIONS.—Except as provided in subsection (k), there are authorized to be appropriated to the Director for the Robert Noyce Teacher Scholarship Program—

"(1) $50,000,000 for fiscal year 2007, of which at least $7,500,000 shall be used for capacity building activities described in subsection (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii);

"(2) $70,000,000 for fiscal year 2008, of which at least $10,500,000 shall be used for capacity building activities described in subsection (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii);

"(3) $90,000,000 for fiscal year 2009, of which at least $13,500,000 shall be used for capacity building activities described in subsection (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii);

"(4) $90,000,000 for fiscal year 2010, of which at least $13,500,000 shall be used for capacity

building activities described in subsection (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii); and

"(5) $90,000,000 for fiscal year 2011, of which at least $13,500,000 shall be used for capacity building activities described in subsection (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii).

"(k) EXCEPTION.—For any fiscal year for which the funding allocated for activities under this section is less than $50,000,000, the amount of funding available for capacity building activities described in paragraphs (1) through (5) of subsection (j) shall not exceed 15 percent of the allocated funds."

SEC. 3. SCIENCE AND MATHEMATICS TEACHER TRAINING PARTNERSHIPS.

(a) IN GENERAL.—Section 9 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n) is amended to read as follows:

"SEC. 9. SCIENCE AND MATHEMATICS TEACHER TRAINING PARTNERSHIPS PROGRAM.

"(a) PROGRAM AUTHORIZED.—

"(1) IN GENERAL.—(A) The Director shall carry out a program to award grants to institutions of higher education or eligible nonprofit organizations (or consortia of such institutions or organizations) to establish science and mathematics teacher

training partnership programs to improve elementary and secondary science and mathematics instruction.

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

"(2) PARTNERSHIPS.—To be eligible to receive a grant under this subsection, an institution of higher education through 1 or more of its departments in science, mathematics, or engineering or an eligible nonprofit organization (or a consortium thereof) shall enter into a partnership with 1 or more local educational agencies that may also include 1 or more businesses.

"(3) REQUIRED USES OF FUNDS.—Grants awarded under this subsection shall be used for activities that draw upon the expertise of the partners to improve teacher content knowledge in science or mathematics at the elementary or secondary levels, such as conducting—

"(A) intensive, content-specific teacher institutes, which may include the provision of stipends or expenses for participants;

"(B) model induction programs for teachers in their first 2 years of teaching; and

"(C) programs to expand the knowledge of existing teachers through sustained, content-specific professional development programs.

"(4) ADDITIONAL USES OF FUNDS.—Grants awarded under this subsection may also be used to conduct—

"(A) programs to train, in both content and pedagogy, teacher leaders who will be granted sufficient nonclassroom time to serve as mentor teachers, as demonstrated by assurances their employing school has provided to the Director, in such time and such manner as the Director may require;

"(B) programs to train teachers to incorporate new technologies into their classroom; and

"(C) programs to train teachers to incorporate laboratory experiences into their lesson plans.

"(b) SELECTION PROCESS.—

"(1) APPLICATION.—An institution of higher education or eligible nonprofit organization seeking funding under subsection (a) 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) a description of the partnership and the role that each member will play in implementing the proposal;

"(B) a description of the activities to be carried out, including—

"(i) the number of teachers to be served;

"(ii) how such activities will be aligned with State science and mathematics achievement standards;

"(iii) how such activities will increase the number or percentage of science and mathematics teachers who are highly qualified teachers, as defined in section 9101 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 7801); and

"(iv) how such activities will reduce the attrition of science and mathematics teachers;

"(C) a description of the need for qualified science and mathematics teachers in the area to be served;

"(D) a description of the manner in which the partnership will be continued after assistance under this program concludes; and

"(E) a description of how the partnership will evaluate the impact of the program.

"(2) REVIEW OF APPLICATIONS.—In evaluating the applications submitted under paragraph (1), the Director shall consider, at a minimum—

"(A) the ability of the partners to effectively carry out the proposed programs;

"(B) the extent to which effective practices can be identified and replicated; and

"(C) the extent to which the evaluation described in paragraph (1)(E) will be independent and based on objective measures.

"(3) AWARDS.—In awarding grants under this section, the Director shall give priority consideration to applications in which the partnership includes a high-need local educational agency and to applications that include activities described in subsection (a)(4)(A).

"(4) MAXIMUM GRANT.—A grant awarded under this section shall not be less than $75,000 or greater than $2,000,000 for any fiscal year.

"(c) ACCOUNTABILITY AND DISSEMINATION.—

1 "(1) ASSESSMENT REQUIRED.—Not later than
2 2 years after the date of enactment of this section,
3 the Director shall establish a common set of bench-
4 marks and assessment tools to allow for the com-
5 parison of practices across grantees.
6 "(2) REPORT.—Not later than 4 years after the
7 date of enactment of this section, the Director shall
8 perform an assessment of the effectiveness of the
9 Science and Mathematics Teacher Training Partner-
10 ships Program established by this section in improv-
11 ing elementary and secondary science and mathe-
12 matics instruction. Not later than 5 years after the
13 date of enactment of this section, the Director shall
14 transmit a report describing the results of this as-
15 sessment to the Committee on Science and the Com-
16 mittee on Education and the Workforce of the
17 House of Representatives and to the Committee on
18 Commerce, Science, and Transportation and the
19 Committee on Health, Education, Labor, and Pen-
20 sions of the Senate. Such reports shall be made
21 widely available to the public.
22 "(d) AUTHORIZATION.—There are authorized to be
23 appropriated to the National Science Foundation for the
24 purpose of this section $50,000,000 for each of the fiscal
25 years 2007 through 2011.".

(b) DEFINITIONS.—Section 4 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n note) is amended—

(1) by amending paragraph (6) to read as follows:

"(6) ELIGIBLE NONPROFIT ORGANIZATION.—The term 'eligible nonprofit organization' means a nonprofit organization, such as a museum or science center, involved in the preparation, training, or certification of science and mathematics teachers.";

(2) by amending paragraph (8) to read as follows:

"(8) HIGH-NEED LOCAL EDUCATIONAL AGENCY.—The term 'high-need local educational agency' means a local educational agency that—

"(A) is receiving grants under title I of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 6301 et seq) as a result of having within its jurisdiction concentrations of children from low income families; and

"(B) is experiencing a shortage of highly qualified teachers, as defined in section 9101 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 7801), in the fields of science, mathematics, or engineering."; and

(3) in paragraph (11) by striking ''master teacher'' and inserting ''teacher leader'' each place it appears.

(c) CONTINUING GRANTS.—This section shall not be construed to terminate any Mathematics and Science Partnership awards made prior to the date of enactment of this Act.

SEC. 4. SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS TALENT EXPANSION PROGRAM.

There are authorized to be appropriated to the Director of the National Science Foundation for the Science, Technology, Engineering, and Mathematics Talent Expansion Program, $40,000,000 for fiscal year 2007, $45,000,000 for fiscal year 2008, $50,000,000 for fiscal year 2009, $50,000,000 for fiscal year 2010, and $50,000,000 for fiscal year 2011.

SEC. 5. INTEGRATIVE GRADUATE EDUCATION AND RESEARCH TRAINEESHIP PROGRAM.

(a) FUNDING.—For each of the fiscal years 2007 through 2011, the Director of the National Science Foundation shall allocate at least 1.5 percent of funds appropriated for Research and Related Activities to the Integrative Graduate Education and Research Traineeship program.

(b) COORDINATION.—The Director shall coordinate with Federal departments and agencies, as appropriate, to expand the interdisciplinary nature of the Integrative Graduate Education and Research Traineeship program.

(c) AUTHORITY TO ACCEPT FUNDS FROM OTHER AGENCIES.—The Director is authorized to accept funds from other Federal departments and agencies to carry out the Integrative Graduate Education and Research Traineeship program.

SEC. 6. ESTABLISHMENT OF CENTERS FOR UNDERGRADUATE EDUCATION IN SCIENCE, MATHEMATICS, AND ENGINEERING.

(a) ESTABLISHMENT.—

(1) IN GENERAL.—(A) The Director of the National Science Foundation shall carry out a program to award grants to departments of science, mathematics, or engineering at institutions of higher education (or consortia thereof) to establish Centers for Undergraduate Education in Science, Mathematics, and Engineering. The program shall be designed to promote the development of curriculum, teaching methods, and teacher training methods to improve the quality of undergraduate science, mathematics, and engineering courses and increase the number of students taking such courses, including nonmajors.

(B) The grants shall be made jointly through the Education and Human Resources Directorate and at least 1 research directorate of the National Science Foundation.

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

(D) Grants awarded under this section shall be for 5 years. The Director may extend a grant under this section for up to 2 additional 3-year periods.

(2) ACTIVITIES.—Grants awarded under this section may be used to—

(A) create model curricula and laboratory programs;

(B) develop and demonstrate research-based instructional methods and technologies;

(C) develop methods to train graduate students and faculty to be more effective teachers;

(D) conduct programs to disseminate curricula, instructional methods, or training methods to faculty at the grantee institutions and at other institutions; and

(E) conduct any other activities the Director determines will accomplish the goals described in paragraph (1)(A).

(b) SELECTION PROCESS.—

1 (1) APPLICATION.—A department of science,
2 mathematics, or engineering of an institution of
3 higher education (or consortium thereof) seeking
4 funding under this section shall submit an applica-
5 tion to the Director at such time, in such manner,
6 and containing such information as the Director
7 may require. At a minimum, the application shall in-
8 clude—
9 (A) a description of the activities to be car-
10 ried out by the Center;
11 (B) a plan for disseminating programs re-
12 lated to the activities carried out by the Center
13 to faculty at the grantee institution and at
14 other institutions;
15 (C) an estimate of the number of faculty,
16 graduate students, and undergraduate students
17 who be affected by the activities carried out by
18 the Center; and
19 (D) a plan for assessing the effectiveness
20 of the Center at accomplishing the goals de-
21 scribed in subsection (a)(1)(A).
22 (2) REVIEW OF APPLICATIONS.—In evaluating
23 the applications submitted under paragraph (1), the
24 Director shall consider, at a minimum—

(A) the ability of the applicant to effectively carry out the proposed activities, including the dissemination activities described in subsection (a)(2)(D); and

(B) the extent to which the faculty, staff, and administrators of the applicant institution are committed to improving undergraduate science, mathematics, and engineering education.

(3) AWARDS.—In awarding grants under the program, the Director shall endeavor to ensure that a wide variety of science, mathematics, and engineering fields and types of institutions of higher education, including 2-year colleges, are covered, and that—

(A) at least 1 center is housed at a Doctoral/Research University as defined by the Carnegie Foundation for the Advancement of Teaching; and

(B) at least 1 center is focused on improving undergraduate education in an interdisciplinary area.

(c) ANNUAL CONFERENCE.—The Director shall convene an annual meeting of the Centers to foster collabora-

1 tion among the Centers and to further disseminate the re-
2 sults of the Centers' activities.

3 (d) AUTHORIZATION OF APPROPRIATIONS.—There
4 are authorized to be appropriated to the National Science
5 Foundation for the purpose of this section $4,000,000 for
6 fiscal year 2007 and $10,000,000 for each of the fiscal
7 years 2008 through 2011.

8 **SEC. 7. EVALUATION OF PROFESSIONAL SCIENCE MAS-**
9 **TERS.**

10 Not earlier than 1 year after the date of enactment
11 of this Act, the Director of the National Science Founda-
12 tion shall enter into an agreement with an appropriate
13 party to assess the impact of the Professional Science
14 Master's (PSM) degree at a variety of institutions, includ-
15 ing the extent to which the degree is interdisciplinary and
16 targeted to emerging fields, the ability of graduates to ob-
17 tain employment in industry relative to those who receive
18 traditional science master's degrees, salary ranges for
19 graduates relative to traditional science masters grad-
20 uates, the extent to which the degree is terminal or grad-
21 uates go on to continue their education, and the success
22 of the degree in attracting traditionally underrepresented
23 populations, including women and minorities. The results
24 of such study, together with any recommendations for
25 Federal support for Professional Science Master's pro-

grams, shall be submitted to the Congress not later than 3 years after the date of enactment of this Act.

SEC. 8. REPORT ON BROADER IMPACTS CRITERION.

Not later than 1 year after the date of enactment of this Act, the Director of the National Science Foundation shall submit to Congress a report on the impact of the broader impacts grant criterion used by the National Science Foundation. The report shall——

(1) identify the criteria that each division and directorate of the Foundation uses to evaluate the broader impacts aspects of research proposals;

(2) provide a breakdown of the types of activities by division that awardees have proposed to carry out to meet the broader impacts criterion;

(3) provide any evaluations performed by the National Science Foundation to assess the degree to which the broader impacts aspects of research proposals were carried out and how effective they have been at meeting the goals described in the research proposals;

(4) describe what national goals, such as improving undergraduate science, mathematics, and engineering education, improving K-12 science and mathematics education, promoting university-industry collaboration and technology transfer, and broad-

ening participation of underrepresented groups, the broader impacts criterion is best suited to promote; and

(5) describe what steps the National Science Foundation is taking and should take to use the broader impacts criterion to improve undergraduate science, mathematics, and engineering education.

SEC. 9. EDUCATION PROGRAMS AT THE DEPARTMENT OF ENERGY.

(a) AUTHORIZATION OF EDUCATION PROGRAMS.—The Secretary of Energy shall carry out education programs and activities in fields related to the Department's mission, which may include awarding scholarships or fellowships for study and research, providing research experiences at National Laboratories for undergraduates, and operating summer institutes to improve the content knowledge of science and mathematics teachers.

(b) INVENTORY AND EVALUATION.—

(1) REPORT.—Not later than 1 year after the date of enactment of this Act, the Secretary of Energy shall transmit a report to the Congress which shall contain—

(A) an inventory of existing education programs and activities at the Department and at the National Laboratories, which shall include a

1 description of each education program or activ-
2 ity supported by the Department or the Na-
3 tional Laboratories, a description of the in-
4 tended beneficiaries, and the amount of Federal
5 funding used to support it; and
6 (B) a schedule for conducting independent
7 evaluations of the education programs and ac-
8 tivities identified under subparagraph (A) to as-
9 sess the impact of such programs and activities
10 on the intended beneficiaries and the larger
11 mission of the Department that shall result in
12 all evaluations of the programs being completed
13 not later than 4 years after the date of enact-
14 ment of this Act.
15 (2) IMPLEMENTATION OF SCHEDULE.—The
16 Secretary shall implement the schedule provided
17 under paragraph (1)(B) and shall transmit each
18 evaluation to the Congress as it is completed, along
19 with a description of any actions the Secretary in-
20 tends to take as a result of the evaluation.
21 (c) NATIONAL LABORATORIES.—The Secretary shall
22 include the conduct of education programs at the National
23 Laboratories and the results of any evaluations of such
24 programs as a factor in the annual setting of the perform-

1 ance and other incentive fees for a National Laboratories
2 management and operations contractor.

3 **SEC. 10. DEFINITION.**

4 In this Act, the term ''institution of higher edu-
5 cation'' has the meaning given such term in section 101(a)
6 of the Higher Education Act of 1965 (20 U.S.C. 1001(a)).

○

SECTION-BY-SECTION SUMMARY OF H.R. 5358,
SCIENCE AND MATHEMATICS EDUCATION FOR COMPETITIVENESS ACT

SEC. 1. SHORT TITLE

"Science and Mathematics Education for Competitiveness Act."

SEC. 2. FINDINGS

Finds that the National Science Foundation has made significant and valuable contributions to the improvement of K–12 and undergraduate science, technology, engineering, and mathematics education and that it should continue to carry out education programs.

SEC. 3. ROBERT NOYCE TEACHER SCHOLARSHIP PROGRAM

Amends Section 10 of the *National Science Foundation Authorization Act of 2002,* which established the Robert Noyce Teacher Scholarship Program. Under the Noyce Program, the National Science Foundation (NSF) provides grants to institutions of higher education to encourage top science, technology, engineering and mathematics (STEM) majors to become teachers. The grants are used both to develop programs to prepare students for teaching and to provide to students who commit to teach for two years at the elementary or secondary school level in return for each year of scholarship aid. H.R. 5358 amends the law by specifying some of the programs grantees must provide to prepare students for teaching, including providing field teaching experience, and by making those programs available to students beginning in their freshman year (even though the scholarships are still available only to juniors and seniors). Also amends the law to specify that both faculty from STEM departments and education faculty must be involved in the program. Also amends the law to increase the minimum scholarship from $7,500 per year to $10,000; to allow additional years of scholarship support for part-time students; to cap the post-graduation service requirement at four years; to extend stipend support for professionals in STEM fields returning to schools for a teaching degree to 16 months from one year to align the support with the length of a typical program; and to allow the Director to accept donations from the private sector to support scholarships, stipends, or internships associated with this program. Also amends the law to allow teaching service to occur in any local educational agency (rather than only in high-need areas), but to reduce the period of service obligation by one year for those scholarship recipients whose service is performed in a high-need local educational agency. Authorizes appropriations for the program of $50,000,000 for fiscal year 2007, $70,000,000 for fiscal year 2008, $90,000,000 for fiscal year 2009, $110,000,000 for fiscal year 2010, and $130,000,000 for fiscal year 2011, and sets aside specific portions of those authorizations for the programmatic (as opposed to scholarship) portions of the Noyce Program.

SEC. 4. SCHOOL AND UNIVERSITY PARTNERSHIPS FOR SCIENCE AND MATHEMATICS EDUCATION

Amends Section 9 of the *National Science Foundation Authorization Act of 2002,* to strengthen the Math and Science Partnerships program at NSF, which provides grants to institutions of higher education (or to eligible nonprofit organizations) to partner with local educational agencies to improve elementary and secondary mathematics and science instruction. Amends the law to clarify that faculty from STEM departments must be the lead participants from the institutions of higher education and clarify that education faculty may participate in the Partnerships. Amends the law to explicitly include as allowable activities developing model induction programs and conducting training to teach Advanced Placement and International Baccalaureate science and mathematics courses. Also amends the law to explicitly allow teacher training activities to include the development and offering of Master's degree programs for in-service mathematics and science teachers that will strengthen their subject area knowledge and pedagogical skills. Amends the law to require the Director of NSF to give priority to applications that include teacher training activities as the main focus of the proposal and to establish that the grant size should be between $75,000 and $2,000,000 per year. Amends the law to require the Director, within a year of the enactment of the Act, to transmit a report to Congress on which completed Math and Science Partnerships projects should be seen as models to be replicated on a more expansive basis at the State or national levels, and, within four years, to transmit a report to Congress summarizing the evaluations each Partnership is required to conduct of its projects and describing any changes to the overall program recommended as a result of these evaluations. Authorizes appropriations for the program of $63,000,000 for fiscal year 2007, $73,000,000 for fiscal

year 2008, $83,000,000 for fiscal year 2009, $93,000,000 for fiscal year 2010, and $103,000,000 for fiscal year 2011.

SEC. 5. SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS TALENT EXPANSION PROGRAM

Amends Section 8(7) of the *National Science Foundation Authorization Act of 2002,* which established at NSF the Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP), which provides grants to institutions of higher education to improve undergraduate education. Amends the law to authorize NSF, as part of STEP, to award grants on a competitive, merit-reviewed basis to institutions of higher education to create Centers to improve undergraduate education through the development and dissemination of undergraduate curriculum and teaching methods, and the development and dissemination of training programs for faculty and graduate students who teach undergraduates. Requires that grants for Centers be made jointly through the NSF Education and Human Resources Directorate and at least one research directorate for periods up to five years, with two possible extensions of no more than three years each. Also requires the Director of NSF, within 180 days, to transmit to Congress a report on how the Director is determining whether current STEP grant recipients are making satisfactory progress toward targets they have set for increasing the number of STEM majors at their institutions and what actions the Director has taken to ensure that funding is continued only to those making satisfactory progress. Authorizes appropriations for STEP of $44,000,000 for fiscal year 2007, of which $4,000,000 shall be for the Centers authorized by this Act; $55,000,000 for fiscal year 2008, of which $10,000,000 shall be for the Centers; $60,000,000 for each of the fiscal years 2009 through 2011, of which $10,000,000 each year shall be for the Centers.

SEC. 6. INTEGRATIVE GRADUATE EDUCATION AND RESEARCH TRAINEESHIP PROGRAM

Requires that the Director allocate at least 1.5 percent of funds appropriated for Research and Related Activities to the Integrative Graduate Education and Research Traineeship (IGERT) Program. Requires that the Director coordinate with federal agencies to expand the interdisciplinary nature of the program, and allows the Director to accept funds from those agencies to carry out the program. (The IGERT program awards grants to institutions of higher education to develop interdisciplinary graduate programs and to provide tuition and stipends for graduate students in those programs.)

SEC. 7. CENTERS FOR RESEARCH ON LEARNING AND EDUCATION IMPROVEMENT

Requires the Director to continue the program on Centers for Research on Learning and Education Improvement as established in section 11 of the *National Science Foundation Authorization Act of 2002.*

SEC. 8. UNDERGRADUATE EDUCATION PROGRAMS

Requires the Director to continue to carry out programs in undergraduate education, including those authorized in section 17 of the *National Science Foundation Authorization Act of 2002.* Funding for these programs shall increase as funding for the National Science Foundation grows.

SEC. 9. EVALUATION OF PROFESSIONAL SCIENCE MASTERS

Requires the Director to arrange for an assessment of the impact of Professional Science Master's (PSM) degree programs at a variety of institutions. Requires that the report be submitted to Congress within three years of the enactment of this Act and include information on the interdisciplinary nature of the degree, the employment and salary prospects of degree recipients compared with those of traditional science Master's graduates, the extent to which PSM graduates continue their education, and the effectiveness of the degree at attracting populations traditionally under-represented in science, technology, engineering, and math fields. (Professional Science Masters programs consist of two years of training in an emerging or interdisciplinary technological area. Many include internships and training in business and communications.)

SEC. 10. REPORT ON BROADER IMPACTS CRITERION

Requires the Director of NSF to submit to Congress within one year of the enactment of this Act a report that evaluates the results of the use of the broader impacts criterion by NSF. (NSF grant proposals are evaluated for their "intellectual merit" and "broader impact," which includes the benefits of the activity to society at large.)

Requires the report to identify how NSF evaluates proposals based on the broader impacts criterion, to categorize the types of broader impacts enumerated by grant applicants, to include any evaluations performed by NSF of the implementation of broader impacts aspects of research proposals, to describe which overarching national goals the broader impacts criterion is best suited to promote, and to describe what steps NSF should take to use the broader impacts criterion to improve undergraduate science, mathematics, and engineering education.

SEC. 11. STUDY ON LABORATORY EQUIPMENT DONATIONS FOR SCHOOLS

Requires the Director, within one year of the enactment of this Act, to transmit to Congress a report on the extent to which universities are donating used laboratory equipment to elementary and secondary schools and how appropriate donations can be encouraged.

SEC. 12. ASSESSMENTS OF NATIONAL SCIENCE FOUNDATION EDUCATION PROGRAMS

Requires the Director, in conducting assessments of NSF education programs, to use assessment methods that allow Foundation programs to be compared to education programs supported by other federal agencies.

SEC. 13. EDUCATION PROGRAMS AT THE DEPARTMENT OF ENERGY

Authorizes education programs at the Department of Energy, through the Office of Science, in fields related to the Office's mission, including activities such as offering scholarships or fellowships for study or research, research experiences for undergraduates, and summer institutes for improving teacher content knowledge in science and mathematics. Requires the Secretary of Energy to submit a report not later than one year after the enactment of this Act that includes an inventory of existing education programs at the Department and the civilian National Laboratories and requires independent evaluations of those programs to be conducted within four years of the enactment of this act. Requires the Department to include the results of evaluations of educational programs run by the civilian National Laboratories as a factor when setting performance and incentive fees for those National Laboratory management and operations contractors.

SEC. 14. DEFINITIONS

Defines "Institution of Higher Education" and "National Laboratory" for this Act.

COMMITTEE ON SCIENCE
FULL COMMITTEE MARKUP

June 7, 2006

AMENDMENT ROSTER

HR 5358, Science and Mathematics Education for Competitiveness Act
--Motion to adopt the bill, as amended: agreed to by a voice vote.
--Motion to report the bill, as amended: agreed to by a voice vote.

No.	Sponsor	Description	Result
1.	Mr. Schwarz, Mr. Boehlert, Mr. Gordon, & Ms. Hooley	Amendment in the Nature of a Substitute to provide more specifics on the program element of the Noyce Program; expand allowable activities and prioritize teacher training in Student and University Partnerships for Math and Science Education; and integrate undergraduate STEM education research centers into STEP program.	--Adopted by a voice vote.
2.	Ms. Matsui	Amendment to Section 3—Robert Noyce Teacher Scholarship Program—to gather information on the retention of participants in the Noyce Program in the teaching profession.	--Adopted by a voice vote.
3.	Ms. Johnson	Amendment to add a new section to the bill to establish a program at NSF to give grants to high-need local educational agencies to purchase lab equipment.	--Unanimous consent to withdraw the amendment: agreed to by a voice vote.

AMENDMENT IN THE NATURE OF A SUBSTITUTE TO H.R. 5358

OFFERED BY MR. SCHWARZ OF MICHIGAN, MR. BOEHLERT OF NEW YORK, MR. GORDON OF TENNESSEE, AND MS. HOOLEY OF OREGON

Strike all after the enacting clause and insert the following:

SECTION 1. SHORT TITLE.

This Act may be cited as the ''Science and Mathematics Education for Competitiveness Act''.

SEC. 2. FINDINGS.

Congress finds the following:

(1) The National Science Foundation has made significant and valuable contributions to the improvement of K–12 and undergraduate science, technology, engineering, and mathematics education throughout its 56 year history.

(2) The National Science Foundation shall continue to carry out the functions described in section 3 of the National Science Foundation Act of 1950 (42 U.S.C. 1862).

SEC. 3. ROBERT NOYCE TEACHER SCHOLARSHIP PROGRAM.

Section 10 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n–1) is amended—

(1) by inserting ''Teacher'' after ''Noyce'' in the section heading and each place it appears in the text;

(2) in subsection (a)(1)—

(A) by striking ''to provide scholarships, stipends, and programming designed''; and

(B) by inserting ''and to provide scholarships and stipends to students participating in the program'' after ''science teachers'';

(3) in subsection (a)(3)(A)—

(A) by striking ''encourage top college juniors and seniors'' and inserting ''recruit and prepare undergraduate students''; and

(B) by inserting ''qualified as'' after ''to become'';

(4) in subsection (a)(3)(A)(ii)—

(A) by striking ''programs to help scholarship recipients'' and inserting ''academic courses and early field teaching experiences designed to prepare students participating in the program'';

(B) by striking "programs that will result in" and inserting "such preparation as is necessary to meet requirements for"; and

(C) by striking "licensing; and" and inserting "licensing;";

(5) in subsection (a)(3)(A)(iii)—

(A) by striking "scholarship recipients" and inserting "students participating in the program";

(B) by striking "enable the recipients" and inserting "enable the students"; and

(C) by striking ";or" and inserting "; and";

(6) in subsection (a)(3)(A) by inserting at the end the following new clause:

"(iv) providing summer internships for freshman and sophomore students participating in the program; or";

(7) in subsection (a)(3)(B)—

(A) by striking "encourage" and inserting "recruit and prepare"; and

(B) by inserting "qualified as" after "to become";

(8) by amending clause (ii) of subsection (a)(3)(B) to read as follows:

"(ii) offering academic courses and field teaching experiences designed to prepare stipend recipients to teach in elementary schools and secondary schools, including such preparation as necessary to meet requirements for teacher certification or licensing;";

(9) in subsection (a) by inserting at the end the following new paragraph:

"(4) ELIGIBILITY REQUIREMENT.—To be eligible for an award under this section, an institution of higher education (or consortia of such institutions) shall ensure that specific faculty members and staff from the institution's mathematics, science, or engineering departments and specific education faculty are designated to carry out the development and implementation of the program. An institution of higher education may also include teacher leaders to participate in developing the pedagogical content of the program and to supervise students participating in the program in their field teaching experiences. No institution of higher education shall be eligible for an award unless faculty from the institution's mathematics, science, or engineering departments are active participants in the program.";

(10) in subsection (b)(1)(A)—

(A) by striking ''scholarship or stipend'';

(B) by inserting ''and summer internships'' after ''number of scholarships''; and

(C) by inserting ''the type of activities proposed for the recruitment of students to the program,'' after ''intends to award,'';

(11) in subsection (b)(1)(B)—

(A) by striking ''scholarship or stipend''; and

(B) by striking '';and'' and inserting '', which may include a description of any existing programs at the applicant's institution that are targeted to the education of science and mathematics teachers and the number of teachers graduated annually from such programs;'';

(12) in subsection (b)(1), by striking subparagraph (C) and inserting the following:

''(C) a description of the academic courses and field teaching experiences required under subsection (a)(3)(A)(ii) and (B)(ii), including—

''(i) a description of the undergraduate program that will enable a student to graduate in 4 years with a major in mathematics, science, or engineering

and to obtain teacher certification or licensing;

"(ii) a description of the field teaching experiences proposed; and

"(iii) evidence of agreements between the applicant and the schools or school districts that are identified as the locations at which field teaching experiences will occur;

"(D) a description of the programs required under subsection (a)(3)(A)(iii) and (B)(iii), including activities to assist new teachers in fulfilling their service requirements under this section; and

"(E) an identification of the applicant's mathematics, science, or engineering faculty and its education faculty who will carry out the development and implementation of the program as required under subsection (a)(4).";

(13) in subsection (b)(2)—

(A) by redesignating subparagraphs (B), (C), (D), and (E) as subparagraphs (C), (D), (E) and (F), respectively; and

(B) by inserting after subparagraph (A) a new subparagraph as follows:

"(B) the extent to which the applicant's mathematics, science, or engineering faculty and its education faculty have worked or will work collaboratively to design new or revised curricula that recognizes the specialized pedagogy required to teach mathematics and science effectively in elementary and secondary schools;";

(14) in subsection (c)(3)—

(A) by striking "$7,500" and inserting "$10,000"; and

(B) by striking "of scholarship support" and inserting "of scholarship support, unless the Director establishes a policy by which part-time students may receive additional years of support";

(15) in subsection (c)(4)—

(A) by inserting ", with a maximum service requirement of 4 years" after "was received"; and

(B) by striking "Service required under this paragraph shall be performed in a high-need local educational agency.";

(16) in subsection (c), by adding at the end a new paragraph as follows:

1 "(5) EXCEPTION.—The period of service obliga-
2 tion under paragraph (4) is reduced by 1 year for
3 scholarship recipients whose service is performed in
4 a high-need local educational agency.";
5 (17) in subsection (d)(1), by striking "to re-
6 ceive certification or licensing to teach" and insert-
7 ing "established under subsection (a)(3)(B)";
8 (18) in subsection (d)(2), by inserting "and
9 professional achievement" after "academic merit";
10 (19) in subsection (d)(3), by striking "1 year"
11 and inserting "16 months";
12 (20) in subsection (d)(4), by striking "for each
13 year a stipend was received";
14 (21) in subsection (g)(2)(A)—
15 (A) by striking "Treasurer of the United
16 States," and inserting "Treasurer of the United
17 States."; and
18 (B) by striking "multiplied by 2."
19 (22) in subsection (i)(3), by inserting "or had
20 a career in" after "is working in"; and
21 (23) by adding at the end the following:
22 "(j) SCIENCE AND MATHEMATICS SCHOLARSHIP
23 GIFT FUND.—In accordance with section 11(f) of the Na-
24 tional Science Foundation Act of 1950, the Director is au-
25 thorized to accept donations from the private sector to

1 support scholarships, stipends, or internships associated
2 with programs under this section.
3 "(k) AUTHORIZATION OF APPROPRIATIONS.—Except
4 as provided in subsection (l), there are authorized to be
5 appropriated to the Director for the Robert Noyce Teacher
6 Scholarship Program—
7 "(1) $50,000,000 for fiscal year 2007, of which
8 at least $7,500,000 shall be used for capacity build-
9 ing activities described in subsection (a)(3)(A)(ii)
10 and (iii) and (B)(ii) and (iii);
11 "(2) $70,000,000 for fiscal year 2008, of which
12 at least $10,500,000 shall be used for capacity
13 building activities described in subsection
14 (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii);
15 "(3) $90,000,000 for fiscal year 2009, of which
16 at least $13,500,000 shall be used for capacity
17 building activities described in subsection
18 (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii);
19 "(4) $110,000,000 for fiscal year 2010, of
20 which at least $16,500,000 shall be used for capac-
21 ity building activities described in subsection
22 (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii); and
23 "(5) $130,000,000 for fiscal year 2011, of
24 which at least $19,500,000 shall be used for capac-

1 ity building activities described in subsection
2 (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii).
3 ''(l) EXCEPTION.—For any fiscal year for which the
4 funding allocated for activities under this section is less
5 than $50,000,000, the amount of funding available for ca-
6 pacity building activities described in paragraphs (1)
7 through (5) of subsection (k) shall not exceed 15 percent
8 of the allocated funds.''.

9 **SEC. 4. SCHOOL AND UNIVERSITY PARTNERSHIPS FOR**
10 **SCIENCE AND MATHEMATICS EDUCATION.**

11 (a) IN GENERAL.—Section 9 of the National Science
12 Foundation Authorization Act of 2002 (42 U.S.C. 1862n)
13 is amended—
14 (1) in the section heading by striking ''**MATHE-**
15 **MATICS AND SCIENCE EDUCATION PARTNER-**
16 **SHIPS**'' and inserting ''**SCHOOL AND UNIVERSITY**
17 **PARTNERSHIPS FOR SCIENCE AND MATHE-**
18 **MATICS EDUCATION**'';
19 (2) in subsection (a)(2)—
20 (A) by striking ''(A)'';
21 (B) by striking subparagraph (B);
22 (C) by inserting '', through 1 or more of
23 its departments in science, mathematics, or en-
24 gineering,'' after ''institution of higher edu-
25 cation''; and

(D) by striking "a State educational agency" and inserting "education faculty from the participating institution or institutions of higher education, a State educational agency,";

(3) in subsection (a)(3)(B) by—

(A) inserting "content-specific" before "professional development programs";

(B) inserting "which are" before "designed"; and

(C) inserting "and which may include teacher training activities to prepare science and mathematics teachers to teach Advanced Placement and International Baccalaureate science and mathematics courses" after "and science teachers";

(4) in subsection (a)(3)(C) by inserting "and laboratory experiences" after "technology" and by inserting "and laboratory" after "provide technical";

(5) in subsection (a)(3)(E) by striking "master teachers" and inserting "teacher leaders";

(6) in subsection (a)(3)(I) by inserting "including model induction programs for teachers in their first 2 years of teaching," after "and science,";

(7) in subsection (a)(3)(K) by striking "developing and offering mathematics or science enrich-

1 ment programs for students, including after-school
2 and summer programs;'' and inserting ''developing
3 educational programs and materials for use in and
4 conducting mathematics or science enrichment pro-
5 grams for students, including after-school programs
6 and summer camps for students described in sub-
7 section (b)(2)(G);'';
8 (8) in subsection (a)(4) by striking ''master
9 teachers'' and inserting ''teacher leaders'' each place
10 it appears;
11 (9) in subsection (a) by inserting at the end the
12 following:
13 ''(8) MASTER'S DEGREE PROGRAMS.—Activities
14 carried out in accordance with paragraph (3)(B)
15 shall include the development and offering of mas-
16 ter's degree programs for in-service mathematics
17 and science teachers that will strengthen their sub-
18 ject area knowledge and pedagogical skills. Grants
19 provided under this section may be used to develop
20 and implement courses of instruction for the mas-
21 ter's degree programs, which may involve online
22 learning, and develop related educational materials.
23 ''(9) MENTORS FOR ADVANCED PLACEMENT
24 COURSES TEACHERS AND STUDENTS.—Partnerships
25 carrying out activities to prepare science and mathe-

1 matics teachers to teach Advanced Placement and
2 International Baccalaureate science and mathe-
3 matics courses in accordance with paragraph (3)(B)
4 shall encourage companies employing scientists,
5 mathematicians, or engineers to provide mentors to
6 teachers and students and provide for the coordina-
7 tion of such mentoring activities.

8 "(10) INVENTIVENESS.—Activities carried out
9 in accordance with paragraph (3)(H) may include
10 the development and dissemination of curriculum
11 tools that will help foster inventiveness and innova-
12 tion.";

13 (10) in subsection (b)(2) by redesignating sub-
14 paragraphs (E) and (F) as subparagraphs (F) and
15 (G), respectively, and inserting after subparagraph
16 (D) the following new subparagraph:

17 "(E) the extent to which the evaluation de-
18 scribed in paragraph (1)(E) will be independent
19 and based on objective measures;";

20 (11) in subsection (b)(3)(A) by striking "and"
21 at the end;

22 (12) in subsection (b)(3) by redesignating sub-
23 paragraph (B) as subparagraph (C) and inserting
24 after subparagraph (A) the following new subpara-
25 graph:

"(B) give priority to applications that include teacher training activities as the main focus of the proposal; and";

(13) in subsection (b) by inserting at the end the following:

"(4) MINIMUM AND MAXIMUM GRANT SIZE.—A grant awarded under this section shall be not less than $75,000 or greater than $2,000,000 for any fiscal year.";

(14) in subsection (c)—

(A) by striking paragraph (2);

(B) by redesignating paragraphs (3), (4), and (5) as paragraphs (4), (5), and (6), respectively; and

(C) by inserting after paragraph (1) the following new paragraphs:

"(2) REPORT ON MODEL PROJECTS.—The Director shall determine which completed projects funded through the program under this section should be seen as models to be replicated on a more expansive basis at the State or national levels. Not later than 1 year after the date of enactment of this paragraph, the Director shall transmit a report describing the results of this study to the Committee on Science and the Committee on Education and the

1 Workforce of the House of Representatives and to
2 the Committee on Commerce, Science, and Trans-
3 portation and the Committee on Health, Education,
4 Labor, and Pensions of the Senate.
5 "(3) REPORT ON EVALUATIONS.—Not later
6 than 4 years after the date of enactment of this
7 paragraph, the Director shall transmit a report sum-
8 marizing the evaluations required under subsection
9 (b)(1)(E) of grants received under this program and
10 describing any changes to the program recommended
11 as a result of these evaluations to the Committee on
12 Science and the Committee on Education and the
13 Workforce of the House of Representatives and to
14 the Committee on Commerce, Science, and Trans-
15 portation and the Committee on Health, Education,
16 Labor, and Pensions of the Senate. Such report
17 shall be made widely available to the public."; and
18 (15) by adding at the end the following new
19 subsection:
20 "(d) DEFINITION.—In this section, the term 'mathe-
21 matics and science teacher' means a mathematics, science,
22 or technology teacher at the elementary school or sec-
23 ondary school level.".

1 (b) DEFINITIONS.—Section 4 of the National Science
2 Foundation Authorization Act of 2002 (42 U.S.C. 1862n
3 note) is amended—
4 (1) by amending paragraph (6) to read as fol-
5 lows:
6 "(6) ELIGIBLE NONPROFIT ORGANIZATION.—
7 The term 'eligible nonprofit organization' means a
8 nonprofit organization, such as a museum or science
9 center, involved in the preparation, training, or cer-
10 tification of science and mathematics teachers.";
11 (2) by amending paragraph (8) to read as fol-
12 lows:
13 "(8) HIGH-NEED LOCAL EDUCATIONAL AGEN-
14 CY.—The term 'high-need local educational agency'
15 means a local educational agency that—
16 "(A) is receiving grants under title I of the
17 Elementary and Secondary Education Act of
18 1965 (20 U.S.C. 6301 et seq) as a result of
19 having within its jurisdiction concentrations of
20 children from low income families; and
21 "(B) is experiencing a shortage of highly
22 qualified teachers, as defined in section 9101 of
23 the Elementary and Secondary Education Act
24 of 1965 (20 U.S.C. 7801), in the fields of
25 science, mathematics, or engineering."; and

(3) in paragraph (11) by striking ''master teacher'' and inserting ''teacher leader'' each place it appears.

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Director of the National Science Foundation for the School and University Partnerships for Science and Mathematics Education program—

(1) $63,000,000 for fiscal year 2007;

(2) $73,000,000 for fiscal year 2008;

(3) $83,000,000 for fiscal year 2009;

(4) $93,000,000 for fiscal year 2010; and

(5) $103,000,000 for fiscal year 2011.

SEC. 5. SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS TALENT EXPANSION PROGRAM.

(a) AMENDMENTS.—Section 8(7) of the National Science Foundation Authorization Act of 2002 is amended—

(1) in subparagraph (A) by striking ''competitive, merit-based'' and all that follows through ''in recent years'' and inserting ''competitive, merit-reviewed multiyear grants for eligible applicants to improve undergraduate education in science, mathematics, engineering and technology through—

1 "(i) the creation of programs to in-
2 crease the number of students studying to-
3 ward and completing associate's or bach-
4 elor's degrees in science, mathematics, en-
5 gineering and technology, particularly in
6 fields that have faced declining enrollment
7 in recent years; and
8 "(ii) the creation of centers to develop
9 undergraduate curriculum, teaching meth-
10 ods for undergraduate courses, and meth-
11 ods to better train professors and teaching
12 assistants who teach undergraduate
13 courses to increase the number of students
14 completing undergraduate courses in
15 science, mathematics, technology, and engi-
16 neering, including the number of non-
17 majors, and to improve student academic
18 achievement in those courses.
19 Grants made under clause (ii) shall be awarded
20 jointly through the Education and Human Re-
21 sources Directorate and at least 1 research di-
22 rectorate of the Foundation.";
23 (2) in subparagraph (B) by striking "under this
24 paragraph" and inserting "under subparagraph
25 (A)(i)";

1 (3) in subparagraph (C)—

2 (A) by inserting "(i)" before "The types

3 of";

4 (B) by redesignating clauses (i) through

5 (vi) as subclauses (I) through (VI), respectively;

6 (C) by striking "under this paragraph"

7 and inserting "under subparagraph (A)(i)"; and

8 (D) by adding at the end the following new

9 clause:

10 "(ii) The types of activities the Foun-

11 dation may support under subparagraph

12 (A)(ii) include—

13 "(I) creating model curricula and

14 laboratory programs;

15 "(II) developing and dem-

16 onstrating research-based instruc-

17 tional methods and technologies;

18 "(III) developing methods to

19 train graduate students and faculty to

20 be more effective teachers of under-

21 graduates;

22 "(IV) conducting programs to

23 disseminate curricula, instructional

24 methods, or training methods to fac-

1 ulty at the grantee institutions and at
2 other institutions;
3 "(V) conducting assessments of
4 the effectiveness of the Center at ac-
5 complishing the goals described in
6 subparagraph (A)(ii); and
7 "(VI) conducting any other ac-
8 tivities the Director determines will
9 accomplish the goals described in sub-
10 paragraph (A)(ii).";
11 (4) in subparagraph (D)(i), by striking "under
12 this paragraph" and inserting "under subparagraph
13 (A)(i)";
14 (5) in subparagraph (D)(ii), by striking "under
15 this paragraph" and inserting "under subparagraph
16 (A)(i)";
17 (6) after subparagraph (D)(iii), by adding the
18 following new clause:
19 "(iv) A grant under subparagraph (A)(ii) shall
20 be awarded for 5 years, and the Director may extend
21 such a grant for up to 2 additional 3 year periods.";
22 (7) in subparagraph (E), by striking "under
23 this paragraph" both places it appears and inserting
24 "under subparagraph (A)(i)";

1 (8) by redesignating subparagraph (F) as sub-
2 paragraph (J); and
3 (9) by inserting after subparagraph (E) the fol-
4 lowing new subparagraphs:
5 "(F) Grants awarded under subparagraph
6 (A)(ii) shall be carried out by a department or de-
7 partments of science, mathematics, or engineering at
8 institutions of higher education (or a consortia
9 thereof), which may partner with education faculty.
10 Applications for awards under subparagraph (A)(ii)
11 shall be submitted to the Director at such time, in
12 such manner, and containing such information as
13 the Director may require. At a minimum, the appli-
14 cation shall include—
15 "(i) a description of the activities to be
16 carried out by the Center;
17 "(ii) a plan for disseminating programs re-
18 lated to the activities carried out by the Center
19 to faculty at the grantee institution and at
20 other institutions;
21 "(iii) an estimate of the number of faculty,
22 graduate students (if any), and undergraduate
23 students who will be affected by the activities
24 carried out by the Center; and

1 "(iv) a plan for assessing the effectiveness
2 of the Center at accomplishing the goals de-
3 scribed in subparagraph (A)(ii).
4 "(G) in evaluating the applications submitted
5 under subparagraph (F), the Director shall consider,
6 at a minimum—
7 "(i) the ability of the applicant to effec-
8 tively carry out the proposed activities, includ-
9 ing the dissemination activities described in
10 subparagraph (C)(ii)(IV); and
11 "(ii) the extent to which the faculty, staff,
12 and administrators of the applicant institution
13 are committed to improving undergraduate
14 science, mathematics, and engineering edu-
15 cation.
16 "(H) In awarding grants under subparagraph
17 (A)(ii), the Director shall endeavor to ensure that a
18 wide variety of science, mathematics, and engineer-
19 ing fields and types of institutions of higher edu-
20 cation, including 2-year colleges, are covered, and
21 that—
22 "(i) at least 1 Center is housed at a Doc-
23 toral/Research University as defined by the
24 Carnegie Foundation for the Advancement of
25 Teaching; and

"(ii) at least 1 Center is focused on improving undergraduate education in an interdisciplinary area.

"(I) The Director shall convene an annual meeting of the awardees under this paragraph to foster collaboration and to disseminate the results of the Centers and the other activities funded under this paragraph.".

(b) REPORT ON DATA COLLECTION.—Not later than 180 days after the date of enactment of this Act, the Director shall transmit to Congress a report on how the Director is determining whether current grant recipients in the Science, Technology, Engineering, and Mathematics Talent Expansion Program are making satisfactory progress as required by section 8(7)(D)(ii) of the National Science Foundation Authorization Act of 2002 and what funding actions have been taken as a result of the Director's determinations.

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Director of the National Science Foundation for the program described in section 8(7) of the National Science Foundation Authorization Act of 2002—

1 (1) $44,000,000 for fiscal year 2007, of which
2 $4,000,000 shall be for the grants described in sub-
3 paragraph (A)(ii);
4 (2) $55,000,000 for fiscal year 2008, of which
5 $10,000,000 shall be for the grants described in
6 subparagraph (A)(ii);
7 (3) $60,000,000 for fiscal year 2009, of which
8 $10,000,000 shall be for the grants described in
9 subparagraph (A)(ii);
10 (4) $60,000,000 for fiscal year 2010, of which
11 $10,000,000 shall be for the grants described in
12 subparagraph (A)(ii); and
13 (5) $60,000,000 for fiscal year 2011, of which
14 $10,000,000 shall be for the grants described in
15 subparagraph (A)(ii).

16 **SEC. 6. INTEGRATIVE GRADUATE EDUCATION AND RE-**
17 **SEARCH TRAINEESHIP PROGRAM.**

18 (a) FUNDING.—For each of the fiscal years 2007
19 through 2011, the Director of the National Science Foun-
20 dation shall allocate at least 1.5 percent of funds appro-
21 priated for Research and Related Activities to the Integra-
22 tive Graduate Education and Research Traineeship pro-
23 gram.
24 (b) COORDINATION.—The Director shall coordinate
25 with Federal departments and agencies, as appropriate,

1 to expand the interdisciplinary nature of the Integrative
2 Graduate Education and Research Traineeship program.
3 (c) AUTHORITY TO ACCEPT FUNDS FROM OTHER
4 AGENCIES.—The Director is authorized to accept funds
5 from other Federal departments and agencies to carry out
6 the Integrative Graduate Education and Research
7 Traineeship program.

8 **SEC. 7. CENTERS FOR RESEARCH ON LEARNING AND EDU-**
9 **CATION IMPROVEMENT.**

10 The Director of the National Science Foundation
11 shall continue to carry out the program of Centers for Re-
12 search on Learning and Education Improvement as estab-
13 lished in section 11 of the National Science Foundation
14 Authorization Act of 2002 (42 U.S.C. 1862n–2).

15 **SEC. 8. UNDERGRADUATE EDUCATION PROGRAMS.**

16 The Director of the National Science Foundation
17 shall continue to carry out programs in undergraduate
18 education, including those authorized in section 17 of the
19 National Science Foundation Authorization Act of 2002
20 (42 U.S.C. 1862n–6). Funding for these programs shall
21 increase as funding for the National Science Foundation
22 grows.

1 **SEC. 9. EVALUATION OF PROFESSIONAL SCIENCE MAS-**
2 **TERS.**

3 Not earlier than 1 year after the date of enactment
4 of this Act, the Director of the National Science Founda-
5 tion shall enter into an agreement with an appropriate
6 party to assess the impact of the Professional Science
7 Master's (PSM) degree at a variety of institutions, includ-
8 ing the extent to which the degree is interdisciplinary and
9 targeted to emerging fields, such as services sciences, the
10 ability of graduates to obtain employment in industry rel-
11 ative to those who receive traditional science master's de-
12 grees, salary ranges for graduates relative to traditional
13 science masters graduates, the extent to which the degree
14 is terminal or graduates go on to continue their education,
15 and the success of the degree in attracting traditionally
16 underrepresented populations, including women and mi-
17 norities. The results of such study, together with any rec-
18 ommendations for Federal support for Professional
19 Science Master's programs, shall be transmitted to the
20 Congress not later than 3 years after the date of enact-
21 ment of this Act.

22 **SEC. 10. REPORT ON BROADER IMPACTS CRITERION.**

23 Not later than 1 year after the date of enactment
24 of this Act, the Director of the National Science Founda-
25 tion shall transmit to Congress a report on the impact of

1 the broader impacts grant criterion used by the National
2 Science Foundation. The report shall——
3 (1) identify the criteria that each division and
4 directorate of the Foundation uses to evaluate the
5 broader impacts aspects of research proposals;
6 (2) provide a breakdown of the types of activi-
7 ties by division that awardees have proposed to carry
8 out to meet the broader impacts criterion;
9 (3) provide any evaluations performed by the
10 National Science Foundation to assess the degree to
11 which the broader impacts aspects of research pro-
12 posals were carried out and how effective they have
13 been at meeting the goals described in the research
14 proposals;
15 (4) describe what national goals, such as im-
16 proving undergraduate science, mathematics, and
17 engineering education, improving K–12 science and
18 mathematics education, promoting university-indus-
19 try collaboration and technology transfer, and broad-
20 ening participation of underrepresented groups, the
21 broader impacts criterion is best suited to promote;
22 and
23 (5) describe what steps the National Science
24 Foundation is taking and should take to use the

1 broader impacts criterion to improve undergraduate
2 science, mathematics, and engineering education.

3 **SEC. 11. STUDY ON LABORATORY EQUIPMENT DONATIONS**
4 **FOR SCHOOLS.**

5 Not later than 2 years after the date of enactment
6 of this Act, the Director of the National Science Founda-
7 tion shall transmit a report to the Congress examining the
8 extent to which institutions of higher education are donat-
9 ing used laboratory equipment to elementary and sec-
10 ondary schools. The Director, in consultation with the Sec-
11 retary of Education, shall survey institutions of higher
12 education to determine—

13 (1) how often, how much, and what type of
14 equipment is donated;

15 (2) what criteria or guidelines the institutions
16 are using to determine what types of equipment can
17 be donated, what condition the equipment should be
18 in, and which schools receive the equipment;

19 (3) whether the institutions provide any support
20 to, or follow-up with the schools; and

21 (4) how appropriate donations can be encour-
22 aged.

1 **SEC. 12. ASSESSMENTS OF NATIONAL SCIENCE FOUNDA-**
2 **TION EDUCATION PROGRAMS.**

3 In conducting assessments of National Science Foun-
4 dation education programs, the Director shall use assess-
5 ment methods that allow Foundation programs to be com-
6 pared to education programs supported by other Federal
7 agencies.

8 **SEC. 13. EDUCATION PROGRAMS AT THE DEPARTMENT OF**
9 **ENERGY.**

10 (a) AUTHORIZATION OF EDUCATION PROGRAMS.—
11 The Secretary of Energy, acting through the Office of
12 Science, shall carry out education programs and activities
13 in fields related to the Office of Science's mission, which
14 may include awarding scholarships or fellowships for study
15 and research, providing research experiences at National
16 Laboratories for undergraduates, and operating summer
17 institutes to improve the content knowledge of science and
18 mathematics teachers.

19 (b) INVENTORY AND EVALUATION.—

20 (1) REPORT.—Not later than 1 year after the
21 date of enactment of this Act, the Secretary of En-
22 ergy shall transmit a report to the Congress which
23 shall contain—

24 (A) an inventory of existing education pro-
25 grams and activities at the Department and at
26 the National Laboratories, which shall include a

1 description of each education program or activ-
2 ity supported by the Department or the Na-
3 tional Laboratories, a description of the in-
4 tended beneficiaries, and the amount of Federal
5 funding used to support it; and
6 (B) a schedule for conducting independent
7 evaluations of the education programs and ac-
8 tivities identified under subparagraph (A) to as-
9 sess the impact of such programs and activities
10 on the intended beneficiaries and the larger
11 mission of the Office of Science that shall result
12 in all evaluations of the programs being com-
13 pleted not later than 4 years after the date of
14 enactment of this Act.
15 (2) IMPLEMENTATION OF SCHEDULE.—The
16 Secretary shall implement the schedule provided
17 under paragraph (1)(B) and shall transmit each
18 evaluation to the Congress as it is completed, along
19 with a description of any actions the Secretary in-
20 tends to take as a result of the evaluation.
21 (c) NATIONAL LABORATORIES.—The Secretary shall
22 include the conduct of education programs at the National
23 Laboratories and the results of any evaluations of such
24 programs as a factor in the annual setting of the perform-

ance and other incentive fees for a National Laboratories management and operations contractor.

SEC. 14. DEFINITIONS.

In this Act—

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

(2) the term ''National Laboratory'' has the meaning given the term ''nonmilitary energy laboratory'' in section 903(3) of the Energy Policy Act of 2005 (42 U.S.C. 16182(3)).

AMENDMENT TO H.R. 5358

OFFERED BY MS. MATSUI OF CALIFORNIA

Page 9, line 3, and page 10, line 3, redesignate subsections (k) and (l) as subsections (l) and (m), respectively.

Page 9, after line 2, insert the following new subsection:

1 "(k) ASSESSMENT OF TEACHER RETENTION.—Not
2 later than 4 years after the date of enactment of this sub-
3 section, the Director shall transmit to Congress a report
4 on the effectiveness of the program carried out under this
5 section regarding the retention of participants in the
6 teaching profession beyond the service obligation required
7 under this section.".

Page 9, line 4, strike "(l)" and insert "(m)".

Page 10, line 7, strike "(k)" and insert "(l)".

AMENDMENT TO H.R. 5358
OFFERED BY MS. EDDIE BERNICE JOHNSON OF TEXAS

Page 31, line 3, redesignate section 14 as section 15.

Page 31, after line 2, insert the following new section:

1 **SEC. 14. PARTNERSHIPS FOR ACCESS TO LABORATORY**
2 **SCIENCE.**
3 (a) PROGRAM AUTHORIZED.—
4 (1) IN GENERAL.—
5 (A) AUTHORITY TO MAKE GRANTS.—The
6 Director of the National Science Foundation (in
7 this section referred to as the ''Director'') shall
8 carry out a program to award grants to up to
9 5 high-need local educational agencies to estab-
10 lish partnerships for access to laboratory
11 science to improve laboratories and provide in-
12 strumentation as part of a comprehensive pro-
13 gram to enhance the quality of mathematics,
14 science, engineering, and technology instruction
15 at the secondary school level.

(B) CRITERIA FOR AWARDING GRANTS.—Grants shall be awarded under this section on a competitive, merit-reviewed basis.

(2) PARTNERSHIPS.—In order to be eligible to receive a grant under this section, a high-need local educational agency shall enter into a partnership that—

(A) includes an institution of higher education or a community college; and

(B) includes at least one—

(i) business or eligible nonprofit organization; or

(ii) State educational agency, other public agency, National Laboratory, or community-based organization.

(3) FEDERAL SHARE.—The Federal share of the cost of activities carried out using amounts from a grant under this section shall not exceed 33 percent.

(4) DURATION.—A high-need local educational agency that receives approval of a grant application submitted under this section shall be eligible to receive grants under this section for activities described in the application for a period of 3 fiscal years.

(5) PLAN REQUIRED.—In order to be eligible for a grant under this section, a high-need local educational agency shall submit to the Director a plan, developed in consultation with teachers, science administrators, scientists, education researchers, and other individuals with expertise in laboratory science and classroom instruction, for carrying out the program under this section. Such plan shall—

(A) describe how the proposed laboratory improvements and instrumentation are consistent with State mathematics and science academic achievement standards;

(B) describe how the proposed laboratory improvement and instrumentation are part of a comprehensive program to enhance the quality of mathematics, science, engineering, and technology instruction, including a description of how the laboratory experiences—

(i) are designed to produce clear learning outcomes;

(ii) are sequenced to complement the classroom science instruction;

(iii) are designed to integrate science learning with science content; and

(iv) will incorporate ongoing student reflection and discussion;

(C) describe professional development and training activities for teachers and school personnel who will be working in the laboratory facilities;

(D) provide assurances that all safety requirements as required by State or local ordinance or by the Director will be met;

(E) describe how the laboratory and instrumentation will be maintained after the period of financial assistance provided under the grant; and

(F) describe how assessment methods will be used to expand the available research literature regarding the effect of laboratory science on student understanding of scientific concepts and student achievement.

(6) USES OF FUNDS.—Grants awarded under this section—

(A) shall be used to supplement and not supplant existing programs or activities; and

(B) shall be used for activities that draw upon the expertise of all partners to improve secondary science education by improving lab-

1 oratories and providing instrumentation as part
2 of a comprehensive program to enhance the
3 quality of mathematics, science, engineering,
4 and technology instruction at the secondary
5 school level in a manner that is consistent with
6 State mathematics and science student aca-
7 demic achievement standards, including—
8 (i) development of a plan for labora-
9 tory improvement and instrumentation
10 that is consistent with State mathematics
11 and science academic achievement stand-
12 ards;
13 (ii) purchase, rental, or leasing of
14 equipment, instrumentation, and other sci-
15 entific educational materials;
16 (iii) maintenance, renovation, and im-
17 provement of laboratory facilities;
18 (iv) professional development and
19 training for teachers;
20 (v) development of curricula and in-
21 structional programs designed to integrate
22 the laboratory experience with classroom
23 instruction;
24 (vi) training in laboratory safety for a
25 school personnel;

(vii) design and implementation of hands-on laboratory experiences to encourage the interest of individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b) in mathematics, science, engineering, and technology and help prepare such individuals to pursue postsecondary studies in these fields;

(viii) development of tools to evaluate activities funded under this subsection; and

(ix) any other activities the Director determines will accomplish the goals of this subsection.

(7) LIMITATION ON USE OF FUNDS.—Grants awarded under this section shall not be used for construction of new facilities.

(b) SELECTION PROCESS.—

(1) APPLICATION.—A high-need local educational agency seeking a grant 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—

(A) a description of the partnership entered into under subsection (a)(2) and the role that each member will play in implementing the proposal;

(B) the plan described in subsection (a)(5);

(C) a description of each of the activities to be carried out using amounts from the grant, together with—

(i) a description of how such activities will be aligned with State mathematics and science student academic achievement standards and with other activities that promote student achievement in mathematics and science;

(ii) a description of how such activities will be based on a review of relevant research, including best practices;

(iii) a description of why such activities are expected to improve student performance and strengthen the quality of mathematics and science instruction;

(iv) a description of any activities that will encourage the interest of individuals identified in section 33 or 34 of the Science and Engineering Equal Opportuni-

ties Act (42 U.S.C. 1885a or 1885b) in mathematics, science, engineering, and technology and how such activities will help prepare such individuals to pursue postsecondary studies in these fields; and

(v) a description of how changes in student achievement will be assessed;

(D) a description of how the partnership will assess its success; and

(E) a description of how programmatic assessments will be made available to the larger research community.

(2) REVIEW OF APPLICATIONS.—In evaluating the applications submitted under paragraph (1), the Director shall consider, at a minimum—

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

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

(C) the degree to which such activities are aligned with State mathematics and science student academic achievement standards;

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

(E) the extent to which the activities will encourage the interest of individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b) in mathematics, science, engineering, and technology and will help prepare such individuals to pursue postsecondary studies in these fields.

(c) REPORT TO CONGRESS.—The Director shall evaluate the program established under this section and report the results to the Committee on Science of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate. At a minimum, such evaluation 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

1 this section with those of partnerships funded by
2 other State or Federal agencies.
3 (d) AUTHORIZATION OF APPROPRIATIONS.—There
4 are authorized to be appropriated to the Director to carry
5 out this section $3,000,000, for the establishment of up
6 to 10 partnerships.