

109TH CONGRESS
2^D 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

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.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Science and Mathe-
5 matics Education for Competitiveness Act”.

1 **SEC. 2. ROBERT NOYCE TEACHER SCHOLARSHIP PRO-**
2 **GRAM.**

3 Section 10 of the National Science Foundation Au-
4 thorization Act of 2002 (42 U.S.C. 1862n-1) is amend-
5 ed—

6 (1) by inserting “Teacher” after “Noyce” in
7 the section heading and each place it appears in the
8 text;

9 (2) in subsection (c)(3)—

10 (A) by striking “\$7,500” and inserting
11 “\$10,000”; and

12 (B) by striking “of scholarship support”
13 and inserting “of scholarship support, unless
14 the Director establishes a policy by which part-
15 time students may receive additional years of
16 support”;

17 (3) in subsection (c)(4), by inserting “with a
18 maximum service requirement of 4 years” after “was
19 received”;

20 (4) in subsection (d)(3), by striking “1 year”
21 and inserting “16 months”;

22 (5) in subsection (d)(4), by striking “for each
23 year a stipend was received”;

24 (6) in subsection (g)(2)(A)—

1 (A) by striking “Treasurer of the United
2 States,” and inserting “Treasurer of the United
3 States.”; and

4 (B) by striking “multiplied by 2.”

5 (7) in subsection (i)(3), by inserting “or had a
6 career in” after “is working in”; and

7 (8) by adding at the end the following:

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

12 “(1) \$50,000,000 for fiscal year 2007, of which
13 at least \$7,500,000 shall be used for capacity build-
14 ing activities described in subsection (a)(3)(A)(ii)
15 and (iii) and (B)(ii) and (iii);

16 “(2) \$70,000,000 for fiscal year 2008, of which
17 at least \$10,500,000 shall be used for capacity
18 building activities described in subsection
19 (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii);

20 “(3) \$90,000,000 for fiscal year 2009, of which
21 at least \$13,500,000 shall be used for capacity
22 building activities described in subsection
23 (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii);

24 “(4) \$90,000,000 for fiscal year 2010, of which
25 at least \$13,500,000 shall be used for capacity

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

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

7 “(k) EXCEPTION.—For any fiscal year for which the
 8 funding allocated for activities under this section is less
 9 than \$50,000,000, the amount of funding available for ca-
 10 pacity building activities described in paragraphs (1)
 11 through (5) of subsection (j) shall not exceed 15 percent
 12 of the allocated funds.”

13 **SEC. 3. SCIENCE AND MATHEMATICS TEACHER TRAINING**
 14 **PARTNERSHIPS.**

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

18 **“SEC. 9. SCIENCE AND MATHEMATICS TEACHER TRAINING**
 19 **PARTNERSHIPS PROGRAM.**

20 “(a) PROGRAM AUTHORIZED.—

21 “(1) IN GENERAL.—(A) The Director shall
 22 carry out a program to award grants to institutions
 23 of higher education or eligible nonprofit organiza-
 24 tions (or consortia of such institutions or organiza-
 25 tions) to establish science and mathematics teacher

1 training partnership programs to improve elemen-
2 tary and secondary science and mathematics instruc-
3 tion.

4 “(B) Grants shall be awarded under this sub-
5 section on a competitive, merit-reviewed basis.

6 “(2) PARTNERSHIPS.—To be eligible to receive
7 a grant under this subsection, an institution of high-
8 er education through 1 or more of its departments
9 in science, mathematics, or engineering or an eligible
10 nonprofit organization (or a consortium thereof)
11 shall enter into a partnership with 1 or more local
12 educational agencies that may also include 1 or more
13 businesses.

14 “(3) REQUIRED USES OF FUNDS.—Grants
15 awarded under this subsection shall be used for ac-
16 tivities that draw upon the expertise of the partners
17 to improve teacher content knowledge in science or
18 mathematics at the elementary or secondary levels,
19 such as conducting—

20 “(A) intensive, content-specific teacher in-
21 stitutes, which may include the provision of sti-
22 pends or expenses for participants;

23 “(B) model induction programs for teach-
24 ers in their first 2 years of teaching; and

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

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

7 “(A) programs to train, in both content
8 and pedagogy, teacher leaders who will be
9 granted sufficient nonclassroom time to serve as
10 mentor teachers, as demonstrated by assur-
11 ances their employing school has provided to
12 the Director, in such time and such manner as
13 the Director may require;

14 “(B) programs to train teachers to incor-
15 porate new technologies into their classroom;
16 and

17 “(C) programs to train teachers to incor-
18 porate laboratory experiences into their lesson
19 plans.

20 “(b) SELECTION PROCESS.—

21 “(1) APPLICATION.—An institution of higher
22 education or eligible nonprofit organization seeking
23 funding under subsection (a) shall submit an appli-
24 cation to the Director at such time, in such manner,
25 and containing such information as the Director

1 may require. The application shall include, at a min-
2 imum—

3 “(A) a description of the partnership and
4 the role that each member will play in imple-
5 menting the proposal;

6 “(B) a description of the activities to be
7 carried out, including—

8 “(i) the number of teachers to be
9 served;

10 “(ii) how such activities will be
11 aligned with State science and mathe-
12 matics achievement standards;

13 “(iii) how such activities will increase
14 the number or percentage of science and
15 mathematics teachers who are highly quali-
16 fied teachers, as defined in section 9101 of
17 the Elementary and Secondary Education
18 Act of 1965 (20 U.S.C. 7801); and

19 “(iv) how such activities will reduce
20 the attrition of science and mathematics
21 teachers;

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

1 “(D) a description of the manner in which
2 the partnership will be continued after assist-
3 ance under this program concludes; and

4 “(E) a description of how the partnership
5 will evaluate the impact of the program.

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

9 “(A) the ability of the partners to effec-
10 tively carry out the proposed programs;

11 “(B) the extent to which effective practices
12 can be identified and replicated; and

13 “(C) the extent to which the evaluation de-
14 scribed in paragraph (1)(E) will be independent
15 and based on objective measures.

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

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

25 “(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.”.

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

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

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

10 **SEC. 6. ESTABLISHMENT OF CENTERS FOR UNDER-**
11 **GRADUATE EDUCATION IN SCIENCE, MATHE-**
12 **MATICS, AND ENGINEERING.**

13 (a) ESTABLISHMENT.—

14 (1) IN GENERAL.—(A) The Director of the Na-
15 tional Science Foundation shall carry out a program
16 to award grants to departments of science, mathe-
17 matics, or engineering at institutions of higher edu-
18 cation (or consortia thereof) to establish Centers for
19 Undergraduate Education in Science, Mathematics,
20 and Engineering. The program shall be designed to
21 promote the development of curriculum, teaching
22 methods, and teacher training methods to improve
23 the quality of undergraduate science, mathematics,
24 and engineering courses and increase the number of
25 students taking such courses, including nonmajors.

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

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

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

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

12 (A) create model curricula and laboratory
13 programs;

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

16 (C) develop methods to train graduate stu-
17 dents and faculty to be more effective teachers;

18 (D) conduct programs to disseminate cur-
19 ricula, instructional methods, or training meth-
20 ods to faculty at the grantee institutions and at
21 other institutions; and

22 (E) conduct any other activities the Direc-
23 tor determines will accomplish the goals de-
24 scribed in paragraph (1)(A).

25 (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—

1 (A) the ability of the applicant to effec-
2 tively carry out the proposed activities, includ-
3 ing the dissemination activities described in
4 subsection (a)(2)(D); and

5 (B) the extent to which the faculty, staff,
6 and administrators of the applicant institution
7 are committed to improving undergraduate
8 science, mathematics, and engineering edu-
9 cation.

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

16 (A) at least 1 center is housed at a Doc-
17 toral/Research University as defined by the
18 Carnegie Foundation for the Advancement of
19 Teaching; and

20 (B) at least 1 center is focused on improv-
21 ing undergraduate education in an interdiscipli-
22 nary area.

23 (c) ANNUAL CONFERENCE.—The Director shall con-
24 vene 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-

1 grams, shall be submitted to the Congress not later than
2 3 years after the date of enactment of this Act.

3 **SEC. 8. REPORT ON BROADER IMPACTS CRITERION.**

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

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

12 (2) provide a breakdown of the types of activi-
13 ties by division that awardees have proposed to carry
14 out to meet the broader impacts criterion;

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

21 (4) describe what national goals, such as im-
22 proving undergraduate science, mathematics, and
23 engineering education, improving K-12 science and
24 mathematics education, promoting university-indus-
25 try collaboration and technology transfer, and broad-

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

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

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

10 (a) **AUTHORIZATION OF EDUCATION PROGRAMS.—**

11 The Secretary of Energy shall carry out education pro-
12 grams and activities in fields related to the Department's
13 mission, which may include awarding scholarships or fel-
14 lowships for study and research, providing research experi-
15 ences at National Laboratories for undergraduates, and
16 operating summer institutes to improve the content knowl-
17 edge of science and mathematics teachers.

18 (b) **INVENTORY AND EVALUATION.—**

19 (1) **REPORT.—**Not later than 1 year after the
20 date of enactment of this Act, the Secretary of En-
21 ergy shall transmit a report to the Congress which
22 shall contain—

23 (A) an inventory of existing education pro-
24 grams and activities at the Department and at
25 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)).

○