

## Union Calendar No.

115<sup>TH</sup> CONGRESS  
1<sup>ST</sup> SESSION

# H. R. 3397

[Report No. 115-]

To direct the National Science Foundation to support STEM education research focused on early childhood.

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### IN THE HOUSE OF REPRESENTATIVES

JULY 25, 2017

Ms. ROSEN (for herself, Mr. KNIGHT, Mr. EVANS, Mr. MEEKS, Mr. TONKO, Ms. HANABUSA, Mr. BEYER, Ms. ESTY of Connecticut, Mr. CRIST, Ms. SLAUGHTER, and Mr. SOTO) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

NOVEMBER --, 2017

Reported with an amendment, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed

[Strike out all after the enacting clause and insert the part printed in *italie*]

[For text of introduced bill, see copy of bill as introduced on July 25, 2017]

# **A BILL**

To direct the National Science Foundation to support STEM  
education research focused on early childhood.

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 “Building Blocks of*  
5 *STEM Act”.*

6 **SEC. 2. FINDINGS.**

7        *The Congress finds the following:*

8            (1) *The National Science Foundation has made*  
9 *the largest financial investment in STEM education*  
10 *of all Federal agencies, and plays a very powerful*  
11 *role in helping to set research and policy agendas.*

12            (2) *Studies have found that children who engage*  
13 *in scientific activities from an early age develop posi-*  
14 *tive attitudes toward science and are more likely to*  
15 *pursue STEM expertise and careers later on.*

16            (3) *However, the majority of current research fo-*  
17 *cuses on increasing STEM opportunities for students*  
18 *in middle school and older.*

19            (4) *Women remain widely underrepresented in*  
20 *the STEM workforce and this gender disparity ex-*  
21 *tends down through all levels of education. Strategic*  
22 *funding of programs is needed in order to understand*  
23 *and address the root cause of this gap.*

24 **SEC. 3. DEFINITIONS.**

25        *In this Act:*

1           (1) *DIRECTOR.*—*The term “Director” means the*  
2           *Director of the National Science Foundation.*

3           (2) *EARLY CHILDHOOD.*—*The term “early child-*  
4           *hood” applies to children from birth through the age*  
5           *of 10.*

6           (3) *INSTITUTION OF HIGHER EDUCATION.*—*The*  
7           *term “institution of higher education” has the mean-*  
8           *ing given the term in section 101(a) of the Higher*  
9           *Education Act of 1965 (20 U.S.C. 1001(a)).*

10          (4) *LOCAL EDUCATIONAL AGENCY.*—*The term*  
11          *“local educational agency” has the meaning given the*  
12          *term in section 8101 of the Elementary and Sec-*  
13          *ondary Education Act of 1965 (20 USC 7801), except*  
14          *that such term also includes preschools, after-school*  
15          *programs, and summer programs.*

16          (5) *STEM.*—*The term “STEM” has the meaning*  
17          *given the term in section 2 of the America COM-*  
18          *PETES Reauthorization Act of 2010 (42 U.S.C. 6621*  
19          *note).*

20          (6) *YOUNG GIRLS.*—*The term “young girls”*  
21          *means female individuals who have not attained the*  
22          *age of 11.*

1 **SEC. 4. SUPPORTING STEM RESEARCH ON EARLY CHILD-**  
2 **HOOD.**

3 *In awarding grants under the Discovery Research*  
4 *PreK–12 program, the Director shall consider age distribu-*  
5 *tion in order to more equitably allocate funding for research*  
6 *studies with a focus on early childhood.*

7 **SEC. 5. SUPPORTING GIRLS IN STEM EDUCATION AND COM-**  
8 **PUTER SCIENCE.**

9 *(a) RESEARCH GRANTS.—*

10 *(1) IN GENERAL.—The Director shall award*  
11 *grants, on a competitive basis, to institutions of high-*  
12 *er education or nonprofit organizations (or consortia*  
13 *of such institutions or organizations), to accelerate re-*  
14 *search efforts to increase understanding of the factors*  
15 *that contribute to the participation of young girls in*  
16 *STEM activities.*

17 *(2) RESEARCH AREAS.—Research areas funded*  
18 *by a grant under this subsection may include—*

19 *(A) the role of teacher training and profes-*  
20 *sional development, including effective incentive*  
21 *structures to encourage teachers to participate in*  
22 *such training and professional development, in*  
23 *encouraging or discouraging young girls from*  
24 *participating in STEM activities;*

25 *(B) the role of teachers in shaping young*  
26 *girls' perceptions of STEM and discouraging*

1           *such girls from participating in STEM activi-*  
2           *ties;*

3           (C) *the role of other facets of the learning*  
4           *environment on the willingness of young girls to*  
5           *participate in STEM activities, including learn-*  
6           *ing materials and textbooks, classroom decora-*  
7           *tions, seating arrangements, use of media and*  
8           *technology, classroom culture, and gender com-*  
9           *position of students during group work;*

10          (D) *the role of parents and other caregivers*  
11          *in encouraging or discouraging young girls from*  
12          *participating in STEM activities;*

13          (E) *the types of STEM activities that elicit*  
14          *greater participation by young girls;*

15          (F) *the role of mentorship and best practices*  
16          *in finding and utilizing mentors;*

17          (G) *the role of informal and out-of-school*  
18          *STEM learning opportunities on girls' percep-*  
19          *tion of and participation in STEM activities;*  
20          *and*

21          (H) *any other activity the Director deter-*  
22          *mines will accomplish the goals of this sub-*  
23          *section.*

24          (3) *GRANT RECIPIENT REPORT.—An entity*  
25          *awarded a grant under this subsection shall report to*

1        *the Director, at such time and in such manner as the*  
2        *Director may require, on the activities carried out*  
3        *and materials developed using such grant funds.*

4        *(b) DEVELOPMENT AND TESTING OF SCALABLE MOD-*  
5        *ELS FOR INCREASED ENGAGEMENT.—*

6            *(1) IN GENERAL.—The Director shall award*  
7        *grants, on a competitive basis, to institutions of high-*  
8        *er education or nonprofit organizations (or consortia*  
9        *of such institutions or organizations), to develop and*  
10       *evaluate interventions in pre-K and elementary school*  
11       *classrooms that increase participation of young girls*  
12       *in computer science activities.*

13           *(2) PARTNERSHIPS.—In order to be eligible to*  
14       *receive a grant under this subsection, an institute of*  
15       *higher education, nonprofit organization, or consor-*  
16       *tium, shall enter into a partnership with one or more*  
17       *local educational agency or State in carrying out the*  
18       *activities funded by such grant.*

19           *(3) USES OF FUNDS.—Grants awarded under*  
20       *this subsection shall be used for activities that draw*  
21       *upon the expertise of the partner entities described in*  
22       *paragraph (2) to increase participation of young girls*  
23       *in computer science activities, including—*

24            *(A) offering training and professional devel-*  
25        *opment programs, including summer or aca-*

1           *ademic year institutes or workshops, designed to*  
2           *strengthen the capabilities of pre-K and elemen-*  
3           *tary school teachers and to familiarize such*  
4           *teachers with the role of gender bias in the class-*  
5           *room;*

6           *(B) offering innovative preservice and in-*  
7           *service programs that instruct teachers on gen-*  
8           *der-inclusive practices for teaching computing*  
9           *concepts;*

10          *(C) developing distance learning programs*  
11          *for teachers or students, including developing*  
12          *curricular materials, play-based computing ac-*  
13          *tivities, and other resources for the in-service*  
14          *professional development of teachers that are*  
15          *made available to teachers through the Internet;*

16          *(D) developing a cadre of master teachers*  
17          *who will promote reform and the adoption of*  
18          *gender-inclusive practices in teaching computer*  
19          *science concepts in early childhood education;*

20          *(E) developing tools to evaluate activities*  
21          *conducted under this subsection;*

22          *(F) developing or adapting pre-K and ele-*  
23          *mentary school computer science curricular ma-*  
24          *terials that incorporate contemporary research*



1           *on the science of learning, particularly with re-*  
2           *spect to gender inclusion;*

3           *(G) developing and offering gender-inclusive*  
4           *computer science enrichment programs for stu-*  
5           *dents, including after-school and summer pro-*  
6           *grams;*

7           *(H) providing mentors for girls in person*  
8           *and through the Internet to support such girls in*  
9           *participating in computer science activities;*

10          *(I) engaging parents of girls about the dif-*  
11          *ficulties faced by girls to maintain an interest*  
12          *and desire to participate in computer science ac-*  
13          *tivities, and enlisting the help of parents in over-*  
14          *coming these difficulties;*

15          *(J) acquainting girls with careers in com-*  
16          *puter science and encouraging girls to consider*  
17          *careers in such field; and*

18          *(K) any other activities the Director deter-*  
19          *mines will accomplish the goals of this sub-*  
20          *section.*

21          *(4) GRANT RECIPIENT REPORT.—An entity*  
22          *awarded a grant under this subsection shall report to*  
23          *the Director, at such time and in such manner as the*  
24          *Director may require, on the activities carried out,*

1        *materials developed using such grant funds, and the*  
2        *outcomes for students served by such grant.*

3            (5) *EVALUATION REQUIRED.*—*Not later than 4*  
4        *years after the date of enactment of this Act, the Di-*  
5        *rector shall evaluate the grant program under this*  
6        *subsection. At a minimum, such evaluation shall—*

7            (A) *use a common set of benchmarks and*  
8        *assessment tools to identify best practices and*  
9        *materials developed and demonstrated by the*  
10       *partnerships described in paragraph (2); and*

11           (B) *to the extent practicable, compare the*  
12       *effectiveness of practices and materials developed*  
13       *and demonstrated by such partnerships with*  
14       *those of partnerships funded by other local or*  
15       *State government or Federal Government pro-*  
16       *grams.*

17           (6) *DISSEMINATION OF RESULTS.*—

18           (A) *EVALUATION RESULTS.*—*The Director*  
19       *shall make publicly available free of charge on*  
20       *an Internet website and shall submit to Congress*  
21       *the results of the evaluation required under para-*  
22       *graph (5).*

23           (B) *MATERIALS.*—*The Director shall ensure*  
24       *that materials developed under a program fund-*  
25       *ed by a grant under this subsection, that are*

1           *demonstrated to be effective in achieving the*  
2           *goals of this subsection (as determined by the Di-*  
3           *rector), are made publicly available free of*  
4           *charge on an Internet website, including through*  
5           *an arrangement with an outside entity.*

6           (7) *ANNUAL MEETING.*—*The Director may con-*  
7           *vene an annual meeting of the partnerships partici-*  
8           *pating in a program funded by a grant under this*  
9           *subsection, for the purpose of fostering greater na-*  
10          *tional collaboration.*

11          (8) *TECHNICAL ASSISTANCE.*—*At the request of a*  
12          *partnership seeking a grant under this subsection, the*  
13          *Director shall provide the partnership with technical*  
14          *assistance in meeting any requirement of this sub-*  
15          *section.*

16 **SEC. 6. COMPUTER SCIENCE IN THE ROBERT NOYCE**  
17                                   **TEACHER SCHOLARSHIP PROGRAM.**

18          *Section 10 of the National Science Foundation Author-*  
19          *ization Act of 2002 (42 U.S.C. 1862n–1) is amended—*

20                   (1) *by striking “and mathematics” each place it*  
21                   *appears and inserting “mathematics, informatics,*  
22                   *and computer science”;*

23                   (2) *in subsection (a)(3)(B), by striking “or*  
24                   *mathematics” and inserting “mathematics,*  
25                   *informatics, and computer science”;*

- 1           (3) in subsections (b)(1)(D)(i), (c)(1)(A), (d)(1),  
2           and (i)(7), by striking “or mathematics” each place  
3           it appears and inserting “mathematics, informatics,  
4           or computer science”; and
- 5           (4) in subsection (i)(5), by striking “or mathe-  
6           matics” and inserting “mathematics, or computer  
7           science”.