

Suspend the Rules and Pass the Bill, H.R. 4979, with an Amendment

(The amendment strikes all after the enacting clause and inserts a new text)

116TH CONGRESS
1ST SESSION

H. R. 4979

To direct the Director of the National Science Foundation to support STEM education and workforce development research focused on rural areas, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

NOVEMBER 5, 2019

Mr. LUCAS (for himself, Mr. MCADAMS, Mr. BAIRD, Ms. JOHNSON of Texas, Mr. CONAWAY, Ms. KENDRA S. HORN of Oklahoma, Mr. WEBER of Texas, Mr. BALDERSON, Mr. NORMAN, Mr. MURPHY of North Carolina, Mr. COMER, Mr. GONZALEZ of Ohio, and Mr. WALTZ) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

A BILL

To direct the Director of the National Science Foundation to support STEM education and workforce development research focused on rural areas, 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 “Rural STEM Edu-
5 cation Act”.

1 **SEC. 2. FINDINGS.**

2 Congress finds the following:

3 (1) The supply of STEM workers is not keeping
4 pace with the rapidly evolving needs of the public
5 and private sector, resulting in a deficit often re-
6 ferred to as a STEM skills shortage.

7 (2) According to the Bureau of Labor Statis-
8 tics, the United States will need one million addi-
9 tional STEM professionals than it is on track to
10 produce in the coming decade.

11 (3) Many STEM occupations offer higher
12 wages, more opportunities for advancement, and a
13 higher degree of job security than non-STEM jobs.

14 (4) The 60,000,000 individuals in the United
15 States who live in rural settings are significantly
16 under-represented in STEM.

17 (5) According to the National Center for Edu-
18 cation Statistics, nine million students in the United
19 States—nearly 20 percent of the total K–12 popu-
20 lation—attend rural schools, and for reasons rang-
21 ing from teacher quality to shortages of resources,
22 these students often have fewer opportunities for
23 high-quality STEM learning than their peers in the
24 Nation’s urban and suburban schools.

25 (6) Rural areas represent one of the most
26 promising, yet underutilized, opportunities for

1 STEM education to impact workforce development
2 and regional innovation, including agriculture.

3 (7) The study of agriculture, food, and natural
4 resources involves biology, engineering, physics,
5 chemistry, math, geology, computer science, and
6 other scientific fields.

7 (8) Employment in computer and information
8 technology occupations is projected to grow 11 per-
9 cent from 2019 to 2029. To help meet this demand,
10 it is important rural students have the opportunity
11 to acquire computing skills through exposure to com-
12 puter science learning in grades PreK - 12 and in
13 informal learning settings.

14 (9) More than 293,000,000 individuals in the
15 United States use high-speed broadband to work,
16 learn, access healthcare, and operate their busi-
17 nesses, while 19,000,000 individuals in the United
18 States still lack access to high-speed broadband.
19 Rural areas are hardest hit, with over 26 percent of
20 individuals in rural areas in the United States lack-
21 ing access to high-speed broadband compared to 1.7
22 percent of individuals in urban areas in the United
23 States.

1 **SEC. 3. NATIONAL SCIENCE FOUNDATION RURAL STEM AC-**
2 **TIVITIES.**

3 (a) PREPARING RURAL STEM EDUCATORS.—

4 (1) IN GENERAL.—The Director shall provide
5 grants on a merit-reviewed, competitive basis to in-
6 stitutions of higher education or nonprofit organiza-
7 tions (or a consortium thereof) for research and de-
8 velopment to advance innovative approaches to sup-
9 port and sustain high-quality STEM teaching in
10 rural schools.

11 (2) USE OF FUNDS.—

12 (A) IN GENERAL.—Grants awarded under
13 this section shall be used for the research and
14 development activities referred to in paragraph
15 (1), which may include—

16 (i) engaging rural educators of stu-
17 dents in grades Pre-K through 12 in pro-
18 fessional learning opportunities to enhance
19 STEM knowledge, including computer
20 science, and develop best practices;

21 (ii) supporting research on effective
22 STEM teaching practices in rural settings,
23 including the use of rubrics and mastery-
24 based grading practices to assess student
25 performance when employing the

1 transdisciplinary teaching approach for
2 STEM disciplines;

3 (iii) designing and developing pre-
4 service and in-service training resources to
5 assist such rural educators in adopting
6 transdisciplinary teaching practices across
7 STEM courses;

8 (iv) coordinating with local partners
9 to adapt STEM teaching practices to lever-
10 age local natural and community assets in
11 order to support in-place learning in rural
12 areas;

13 (v) providing hands-on training and
14 research opportunities for rural educators
15 described in clause (i) at Federal Labora-
16 tories, institutions of higher education, or
17 in industry;

18 (vi) developing training and best prac-
19 tices for educators who teach multiple
20 grade levels within a STEM discipline;

21 (vii) designing and implementing pro-
22 fessional development courses and experi-
23 ences, including mentoring, for rural edu-
24 cators described in clause (i) that combine
25 face-to-face and online experiences; and

1 (viii) any other activity the Director
2 determines will accomplish the goals of this
3 subsection.

4 (B) RURAL STEM COLLABORATIVE.—The
5 Director may establish a pilot program of re-
6 gional cohorts in rural areas that will provide
7 peer support, mentoring, and hands-on research
8 experiences for rural STEM educators of stu-
9 dents in grades Pre-K through 12, in order to
10 build an ecosystem of cooperation among edu-
11 cators, researchers, academia, and local indus-
12 try.

13 (b) BROADENING PARTICIPATION OF RURAL STU-
14 DENTS IN STEM.—

15 (1) IN GENERAL.—The Director shall provide
16 grants on a merit-reviewed, competitive basis to in-
17 stitutions of higher education or nonprofit organiza-
18 tions (or a consortium thereof) for—

19 (A) research and development of program-
20 ming to identify the barriers rural students face
21 in accessing high-quality STEM education; and

22 (B) development of innovative solutions to
23 improve the participation and advancement of
24 rural students in grades Pre-K through 12 in
25 STEM studies.

1 (2) USE OF FUNDS.—

2 (A) IN GENERAL.—Grants awarded under
3 this section shall be used for the research and
4 development activities referred to in paragraph
5 (1), which may include—

6 (i) developing partnerships with com-
7 munity colleges to offer advanced STEM
8 course work, including computer science, to
9 rural high school students;

10 (ii) supporting research on effective
11 STEM practices in rural settings;

12 (iii) implementing a school-wide
13 STEM approach;

14 (iv) improving the National Science
15 Foundation's Advanced Technology Edu-
16 cation program's coordination and engage-
17 ment with rural communities;

18 (v) collaborating with existing commu-
19 nity partners and networks, such as the co-
20 operative research and extension services
21 of the Department of Agriculture and
22 youth serving organizations like 4-H, after
23 school STEM programs, and summer
24 STEM programs, to leverage community

1 resources and develop place-based pro-
2 gramming;

3 (vi) connecting rural school districts
4 and institutions of higher education, to im-
5 prove precollegiate STEM education and
6 engagement;

7 (vii) supporting partnerships that
8 offer hands-on inquiry-based science activi-
9 ties, including coding, and access to lab re-
10 sources for students studying STEM in
11 grades Pre–K through 12 in a rural area;

12 (viii) evaluating the role of broadband
13 connectivity and its associated impact on
14 the STEM and technology literacy of rural
15 students;

16 (ix) building capacity to support ex-
17 tracurricular STEM programs in rural
18 schools, including mentor-led engagement
19 programs, STEM programs held during
20 nonschool hours, STEM networks,
21 makerspaces, coding activities, and com-
22 petitions; and

23 (x) any other activity the Director de-
24 termines will accomplish the goals of this
25 subsection.

1 (c) APPLICATION.—An applicant seeking a grant
2 under subsection (a) or (b) shall submit an application at
3 such time, in such manner, and containing such informa-
4 tion as the Director may require. The application may in-
5 clude the following:

6 (1) A description of the target population to be
7 served by the research activity or activities for which
8 such grant is sought.

9 (2) A description of the process for recruitment
10 and selection of students, educators, or schools from
11 rural areas to participate in such activity or activi-
12 ties.

13 (3) A description of how such activity or activi-
14 ties may inform efforts to promote the engagement
15 and achievement of rural students in grades PreK -
16 12 in STEM studies.

17 (4) In the case of a proposal consisting of a
18 partnership or partnerships with one or more rural
19 schools and one or more researchers, a plan for es-
20 tablishing a sustained partnership that is jointly de-
21 veloped and managed, draws from the capacities of
22 each partner, and is mutually beneficial.

23 (d) PARTNERSHIPS.—In awarding grants under sub-
24 section (a) or (b), the Director shall—

1 (1) encourage applicants which, for the purpose
2 of the activity or activities funded through the grant,
3 include or partner with a nonprofit organization or
4 an institution of higher education (or a consortium
5 thereof) that has extensive experience and expertise
6 in increasing the participation of rural students in
7 grades Pre-K through 12 in STEM;

8 (2) encourage applicants which, for the purpose
9 of the activity or activities funded through the grant,
10 include or partner with a consortium of rural schools
11 or rural school districts; and

12 (3) encourage applications which, for the pur-
13 pose of the activity or activities funded through the
14 grant, include commitments from school principals
15 and administrators to making reforms and activities
16 proposed by the applicant a priority.

17 (e) EVALUATIONS.—All proposals for grants under
18 subsections (a) and (b) shall include an evaluation plan
19 that includes the use of outcome oriented measures to as-
20 sess the impact and efficacy of the grant. Each recipient
21 of a grant under this section shall include results from
22 these evaluative activities in annual and final projects.

23 (f) ACCOUNTABILITY AND DISSEMINATION.—

1 (1) EVALUATION REQUIRED.—The Director
2 shall evaluate the portfolio of grants awarded under
3 subsections (a) and (b). Such evaluation shall—

4 (A) use a common set of benchmarks and
5 tools to assess the results of research conducted
6 under such grants and identify best practices;
7 and

8 (B) to the extent practicable, integrate the
9 findings of research resulting from the activity
10 or activities funded through such grants with
11 the findings of other research on rural student's
12 pursuit of degrees or careers in STEM.

13 (2) REPORT ON EVALUATIONS.—Not later than
14 180 days after the completion of the evaluation
15 under paragraph (1), the Director shall submit to
16 Congress and make widely available to the public a
17 report that includes—

18 (A) the results of the evaluation; and

19 (B) any recommendations for administra-
20 tive and legislative action that could optimize
21 the effectiveness of the grants awarded under
22 this section.

23 (g) REPORT BY COMMITTEE ON EQUAL OPPORTUNI-
24 TIES IN SCIENCE AND ENGINEERING.—

1 (1) IN GENERAL.—As part of the first report
2 required by section 36(e) of the Science and Engi-
3 neering Equal Opportunities Act (42 U.S.C.
4 1885c(e)) transmitted to Congress after the date of
5 enactment of this Act, the Committee on Equal Op-
6 portunities in Science and Engineering shall in-
7 clude—

8 (A) a description of past and present poli-
9 cies and activities of the Foundation to encour-
10 age full participation of students in rural com-
11 munities in science, mathematics, engineering,
12 and computer science fields; and

13 (B) an assessment of trends in participa-
14 tion of rural students in grades Pre-K through
15 12 in Foundation activities, and an assessment
16 of the policies and activities of the Foundation,
17 along with proposals for new strategies or the
18 broadening of existing successful strategies to-
19 wards facilitating the goals of this Act.

20 (2) TECHNICAL CORRECTION.—

21 (A) IN GENERAL.—Section 313 of the
22 American Innovation and Competitiveness Act
23 (Public Law 114–329) is amended by striking
24 “Section 204(e) of the National Science Foun-
25 dation Authorization Act of 1988” and insert-

1 ing “Section 36(e) of the Science and Engineer-
2 ing Equal Opportunities Act”.

3 (B) APPLICABILITY.—The amendment
4 made by paragraph (1) shall take effect as if
5 included in the enactment of section 313 of the
6 American Innovation and Competitiveness Act
7 (Public Law 114–329).

8 (h) COORDINATION.—In carrying out this section, the
9 Director shall, for purposes of enhancing program effec-
10 tiveness and avoiding duplication of activities, consult, co-
11 operate, and coordinate with the programs and policies of
12 other relevant Federal agencies.

13 (i) AUTHORIZATION OF APPROPRIATIONS.—There
14 are authorized to be appropriated to the Director—

15 (1) \$8,000,000 to carry out the activities under
16 subsection (a) for each of fiscal years 2021 through
17 2025; and

18 (2) \$12,000,000 to carry out the activities
19 under subsection (b) for each of fiscal years 2021
20 through 2025.

21 **SEC. 4. OPPORTUNITIES FOR ONLINE EDUCATION.**

22 (a) IN GENERAL.—The Director shall, subject to ap-
23 propriations, award competitive grants to institutions of
24 higher education or nonprofit organizations (or a consor-
25 tium thereof, which may include a private sector partner)

1 to conduct research on online STEM education courses for
2 rural communities.

3 (b) RESEARCH AREAS.—The research areas eligible
4 for funding under this subsection shall include—

5 (1) evaluating the learning and achievement of
6 rural students in grades Pre–K through 12 in
7 STEM subjects;

8 (2) understanding how computer-based and on-
9 line professional development courses and mentor ex-
10 periences can be integrated to meet the needs of
11 educators of rural students in grades Pre–K through
12 12;

13 (3) combining computer-based and online
14 STEM education and training with apprenticeships,
15 mentoring, or other applied learning arrangements;

16 (4) leveraging online programs to supplement
17 STEM studies for rural students that need physical
18 and academic accommodation; and

19 (5) any other activity the Director determines
20 will accomplish the goals of this subsection.

21 (c) EVALUATIONS.—All proposals for grants under
22 this section shall include an evaluation plan that includes
23 the use of outcome oriented measures to assess the impact
24 and efficacy of the grant. Each recipient of a grant under

1 this section shall include results from these evaluative ac-
2 tivities in annual and final projects.

3 (d) ACCOUNTABILITY AND DISSEMINATION.—

4 (1) EVALUATION REQUIRED.—The Director
5 shall evaluate the portfolio of grants awarded under
6 this section. Such evaluation shall—

7 (A) use a common set of benchmarks and
8 tools to assess the results of research conducted
9 under such grants and identify best practices;
10 and

11 (B) to the extent practicable, integrate
12 findings from activities carried out pursuant to
13 research conducted under this section, with re-
14 spect to the pursuit of careers and degrees in
15 STEM, with those activities carried our pursu-
16 ant to other research on serving rural students
17 and communities.

18 (2) REPORT ON EVALUATIONS.—Not later than
19 180 days after the completion of the evaluation
20 under paragraph (1), the Director shall submit to
21 Congress and make widely available to the public a
22 report that includes—

23 (A) the results of the evaluation; and

24 (B) any recommendations for administra-
25 tive and legislative action that could optimize

1 the effectiveness of the grants awarded under
2 this section.

3 (e) COORDINATION.—In carrying out this section, the
4 Director shall, for purposes of enhancing program effec-
5 tiveness and avoiding duplication of activities, consult, co-
6 operate, and coordinate with the programs and policies of
7 other relevant Federal agencies.

8 **SEC. 5. NATIONAL ACADEMY OF SCIENCES EVALUATION.**

9 (a) STUDY.—Not later than 12 months after the date
10 of enactment of this Act, the Director shall enter into an
11 agreement with the National Academy of Sciences under
12 which the National Academy agrees to conduct an evalua-
13 tion and assessment that—

14 (1) evaluates the quality and quantity of cur-
15 rent Federal programming and research directed at
16 examining STEM education for students in grades
17 Pre-K through 12 and workforce development in
18 rural areas;

19 (2) assesses the impact of the scarcity of
20 broadband connectivity in rural communities has on
21 STEM and technical literacy for students in grades
22 Pre-K through 12 in rural areas;

23 (3) assesses the core research and data needed
24 to understand the challenges rural areas are facing

1 in providing quality STEM education and workforce
2 development; and

3 (4) makes recommendations for action at the
4 Federal, State, and local levels for improving STEM
5 education for students in grades Pre–K through 12
6 and workforce development in rural areas.

7 (b) REPORT TO DIRECTOR.—The agreement entered
8 into under subsection (a) shall require the National Acad-
9 emy of Sciences, not later than 24 months after the date
10 of enactment of this Act, to submit to the Director a re-
11 port on the study conducted under such subsection, includ-
12 ing the National Academy’s findings and recommenda-
13 tions.

14 (c) AUTHORIZATION OF APPROPRIATIONS.—There
15 are authorized to be appropriated to the Director to carry
16 out this section \$1,000,000 for fiscal year 2021.

17 **SEC. 6. GAO REVIEW.**

18 Not later than 3 years after the date of enactment
19 of this Act, the Comptroller General of the United States
20 shall conduct a study on the engagement of rural popu-
21 lations in Federal STEM programs and submit to Con-
22 gress a report that includes—

23 (1) an assessment of how Federal STEM edu-
24 cation programs are serving rural populations;

1 (2) a description of initiatives carried out by
2 Federal agencies that are targeted at supporting
3 STEM education in rural areas;

4 (3) an assessment of what is known about the
5 impact and effectiveness of Federal investments in
6 STEM education programs that are targeted to
7 rural areas; and

8 (4) an assessment of challenges that state and
9 Federal STEM education programs face in reaching
10 rural population centers.

11 **SEC. 7. CAPACITY BUILDING THROUGH EPSCOR.**

12 Section 517(f)(2) of the America COMPETES Reau-
13 thorization Act of 2010 (42 U.S.C. 1862p-9(f)(2)) is
14 amended—

15 (1) in subparagraph (A), by striking “and” at
16 the end; and

17 (2) by adding at the end the following:

18 “(C) to increase the capacity of rural com-
19 munities to provide quality STEM education
20 and STEM workforce development program-
21 ming to students, and teachers; and”.

22 **SEC. 8. NIST ENGAGEMENT WITH RURAL COMMUNITIES.**

23 (a) MEP OUTREACH.—Section 25 of the National
24 Institute of Standards and Technology Act (15 U.S.C.
25 278k) is amended—

1 (1) in subsection (c)—

2 (A) in paragraph (6), by striking “commu-
3 nity colleges and area career and technical edu-
4 cation schools” and inserting the following:
5 “secondary schools (as defined in section 8101
6 of the Elementary and Secondary Education
7 Act of 1965 (20 U.S.C. 7801)), community col-
8 leges, and area career and technical education
9 schools, including those in underserved and
10 rural communities,”; and

11 (B) in paragraph (7)—

12 (i) by striking “and local colleges”
13 and inserting the following: “local high
14 schools and local collseges, including those
15 in underserved and rural communities,”;
16 and

17 (ii) by inserting “or other applied
18 learning opportunities” after “apprentice-
19 ships”; and

20 (2) in subsection (d)(3) by striking “, commu-
21 nity colleges, and area career and technical edu-
22 cation schools,” and inserting the following: “and
23 local high schools, community colleges, and area ca-
24 reer and technical education schools, including those
25 in underserved and rural communities,”.

1 (b) RURAL CONNECTIVITY PRIZE COMPETITION.—

2 (1) PRIZE COMPETITION.—Pursuant to section
3 24 of the Stevenson-Wydler Technology Innovation
4 Act of 1980 (15 U.S.C. 3719), the Secretary of
5 Commerce, acting through the Under Secretary of
6 Commerce for Standards and Technology (referred
7 to in this subsection as the “Secretary”), shall, sub-
8 ject to appropriations, carry out a program to award
9 prizes competitively to stimulate research and devel-
10 opment of creative technologies in order to deploy
11 affordable and reliable broadband connectivity to un-
12 derserved rural communities.

13 (2) PLAN FOR DEPLOYMENT IN RURAL COMMU-
14 NITIES.—Each proposal submitted pursuant to para-
15 graph (1) shall include a plan for deployment of the
16 technology that is the subject of such proposal in an
17 underserved rural community.

18 (3) PRIZE AMOUNT.—In carrying out the pro-
19 gram under paragraph (1), the Secretary may award
20 not more than a total of \$5,000,000 to one or more
21 winners of the prize competition.

22 (4) REPORT.—Not later than 60 days after the
23 date on which a prize is awarded under the prize
24 competition, the Secretary shall submit to the rel-

1 evant committees of Congress a report that describes
2 the winning proposal of the prize competition.

3 (5) CONSULTATION.—In carrying out the pro-
4 gram under subsection (a), the Secretary may con-
5 sult with the heads of relevant departments and
6 agencies of the Federal Government.

7 **SEC. 9. NITR-D BROADBAND WORKING GROUP.**

8 Title I of the High-Performance Computing Act of
9 1991 (15 U.S.C. 5511 et seq.) is amended by adding at
10 the end the following:

11 **“SEC. 103. BROADBAND RESEARCH AND DEVELOPMENT**
12 **WORKING GROUP.**

13 “(a) IN GENERAL.—The Director shall establish a
14 broadband research and development working group to ad-
15 dress national research challenges and opportunities for
16 improving broadband access and adoption across the
17 United States.

18 “(b) ACTIVITIES.—The working group shall identify
19 and coordinate key research priorities for addressing
20 broadband access and adoption, including—

21 “(1) promising research areas;

22 “(2) requirements for data collection and shar-
23 ing;

1 “(3) opportunities for better alignment and co-
2 ordination across Federal agencies and external
3 stakeholders; and

4 “(4) input on the development of new Federal
5 policies and programs to enhance data collection and
6 research.

7 “(c) COORDINATION.—The working group shall co-
8 ordinate, as appropriate, with the Rural Broadband Inte-
9 gration Working Group established under section 6214 of
10 the Agriculture Improvement Act of 2018 (Public Law
11 115–334) and the National Institute of Food and Agri-
12 culture of the Department of Agriculture.

13 “(d) REPORT.—The working group shall report to
14 Congress on their activities as part of the annual report
15 submitted under section 101(a)(2)(D).

16 “(e) SUNSET.—The authority to carry out this sec-
17 tion shall terminate on the date that is 5 years after the
18 date of enactment of the Rural STEM Education Act.”.

19 **SEC. 10. DEFINITIONS.**

20 In this Act:

21 (1) DIRECTOR.—The term “Director” means
22 the Director of the National Science Foundation es-
23 tablished under section 2 of the National Science
24 Foundation Act of 1950 (42 U.S.C. 1861).

1 (2) FEDERAL LABORATORY.—The term “Fed-
2 eral laboratory” has the meaning given such term in
3 section 4 of the Stevenson-Wydler Technology Inno-
4 vation Act of 1980 (15 U.S.C. 3703).

5 (3) FOUNDATION.—The term “Foundation”
6 means the National Science Foundation established
7 under section 2 of the National Science Foundation
8 Act of 1950 (42 U.S.C. 1861).

9 (4) INSTITUTION OF HIGHER EDUCATION.—The
10 term “institution of higher education” has the
11 meaning given such term in section 101(a) of the
12 Higher Education Act of 1965 (20 U.S.C. 1001(a)).

13 (5) STEM.—The term “STEM” has the mean-
14 ing given the term in section 2 of the America COM-
15 PETES Reauthorization Act of 2010 (42 U.S.C.
16 6621 note).

17 (6) STEM EDUCATION.—The term “STEM
18 education” has the meaning given the term in sec-
19 tion 2 of the STEM Education Act of 2015 (42
20 U.S.C. 6621 note).