

made in the daily lives of people around the world, with new and exciting products and lifesaving cures and innovations.

Chemistry also employs hundreds of thousands of people in good-paying jobs and has made the country the world leader in an endless list of industries and fields. Today's legislation will help that progress continue by directing the Federal Government to improve its coordination of sustainable chemistry research.

The Sustainable Chemistry Research and Development Act of 2019 will bring together the Federal Government, the private sector, and the scientific community to support groundbreaking research in chemistry and keep our Nation at the forefront of innovation.

I thank my colleagues for their support.

□ 1530

Ms. JOHNSON of Texas. Mr. Speaker, I reserve the balance of my time.

Mr. LUCAS. Mr. Speaker, I yield myself such time as I may consume.

Mr. Speaker, to ensure the continued leadership of the United States in science and technology, we must invest in research that will lead to the industries of the future. The Sustainable Chemistry Act of 2019 will keep our country at the forefront of chemistry innovation and help create new products that will benefit all Americans.

Mr. Speaker, I urge my colleagues to support H.R. 2051, and I yield back the balance of my time.

Ms. JOHNSON of Texas. Mr. Speaker, I simply wish to thank our authors and our staff, and I urge passage of this bill. I yield back the balance of my time.

The SPEAKER pro tempore. The question is on the motion offered by the gentlewoman from Texas (Ms. JOHNSON) that the House suspend the rules and pass the bill, H.R. 2051, as amended.

The question was taken; and (two-thirds being in the affirmative) the rules were suspended and the bill, as amended, was passed.

A motion to reconsider was laid on the table.

#### BUILDING BLOCKS OF STEM ACT

Ms. JOHNSON of Texas. Mr. Speaker, I move to suspend the rules and pass the bill (S. 737) to direct the National Science Foundation to support STEM education research focused on early childhood.

The Clerk read the title of the bill.

The text of the bill is as follows:

S. 737

*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 "Building Blocks of STEM Act".

#### SEC. 2. FINDINGS.

Congress finds the following:

(1) The National Science Foundation is a large investor in STEM education and plays

a key role in setting research and policy agendas.

(2) While studies have found that children who engage in scientific activities from an early age develop positive attitudes toward science and are more likely to pursue STEM expertise and careers later on, the majority of current research focuses on increasing STEM opportunities for middle school-aged children and older.

(3) Women remain widely underrepresented in the STEM workforce, and this disparity extends down through all levels of education.

#### SEC. 3. SUPPORTING EARLY CHILDHOOD AND ELEMENTARY STEM EDUCATION RESEARCH.

In awarding grants under the Discovery Research PreK–12 program, the Director of the National Science Foundation shall consider the age distribution of a STEM education research and development project to improve the focus of research and development on elementary and prekindergarten education.

#### SEC. 4. SUPPORTING FEMALE STUDENTS IN PRE-KINDERGARTEN THROUGH ELEMENTARY SCHOOL IN STEM EDUCATION.

Section 305(d) of the American Innovation and Competitiveness Act (42 U.S.C. 1862s–5(d)) is amended by adding at the end the following:

"(3) RESEARCH.—As a component of improving participation of women in STEM fields, research funded by a grant under this subsection may include research on—

"(A) the role of teacher training and professional development, including effective incentive structures to encourage teachers to participate in such training and professional development, in encouraging or discouraging female students in prekindergarten through elementary school from participating in STEM activities;

"(B) the role of teachers in shaping perceptions of STEM in female students in prekindergarten through elementary school and discouraging such students from participating in STEM activities;

"(C) the role of other facets of the learning environment on the willingness of female students in prekindergarten through elementary school to participate in STEM activities, including learning materials and textbooks, seating arrangements, use of media and technology, classroom culture, and composition of students during group work;

"(D) the role of parents and other caregivers in encouraging or discouraging female students in prekindergarten through elementary school from participating in STEM activities;

"(E) the types of STEM activities that encourage greater participation by female students in prekindergarten through elementary school;

"(F) the role of mentorship and best practices in finding and utilizing mentors; and

"(G) the role of informal and after-school STEM learning opportunities on the perception of and participation in STEM activities of female students in prekindergarten through elementary school."

#### SEC. 5. SUPPORTING FEMALE STUDENTS IN PRE-KINDERGARTEN THROUGH ELEMENTARY SCHOOL IN COMPUTER SCIENCE EDUCATION.

Section 310(b) of the American Innovation and Competitiveness Act (42 U.S.C. 1862s–7(b)) is amended by adding at the end the following:

"(3) USES OF FUNDS.—The tools and models described in paragraph (2)(C) may include—

"(A) offering training and professional development programs, including summer or academic year institutes or workshops, designed to strengthen the capabilities of prekindergarten and elementary school teachers and to familiarize such teachers with the

role of bias against female students in the classroom;

"(B) offering innovative pre-service and in-service programs that instruct teachers on female-inclusive practices for teaching computing concepts;

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

"(D) developing or adapting prekindergarten and elementary school computer science curricular materials that incorporate contemporary research on the science of learning, particularly with respect to female inclusion;

"(E) developing and offering female-inclusive computer science enrichment programs for students, including after-school and summer programs;

"(F) providing mentors for female students in prekindergarten through elementary school to support such students in participating in computer science activities;

"(G) engaging female students in prekindergarten through elementary school, and their guardians (if such communication takes place on school premises during otherwise-scheduled conferences or formal conversations between teachers and guardians) about—

"(i) the difficulties faced by female students with regard to maintaining an interest in participating in computer science activities; and

"(ii) the potential positive career benefits of engaging in such activities;

"(H) acquainting female students in prekindergarten through elementary school with careers in computer science and encouraging such students to consider careers in the computer science field; and

"(I) developing tools to evaluate activities conducted under this subsection, including reports for evaluating the effectiveness of activities under this section."

The SPEAKER pro tempore. Pursuant to the rule, the gentlewoman from Texas (Ms. JOHNSON) and the gentleman from Oklahoma (Mr. LUCAS) each will control 20 minutes.

The Chair recognizes the gentlewoman from Texas.

#### GENERAL LEAVE

Ms. JOHNSON of Texas. Mr. Speaker, I ask unanimous consent that all Members may have 5 legislative days in which to revise and extend their remarks and to include extraneous material on S. 737, the bill under consideration.

The SPEAKER pro tempore. Is there objection to the request of the gentlewoman from Texas?

There was no objection.

Ms. JOHNSON of Texas. Mr. Speaker, I yield myself such time as I may consume.

Mr. Speaker, I rise today in support of S. 737, the Building Blocks of STEM Act.

The demand for computer science skills is on the rise across all sectors of the economy. To ensure that we have the capacity to meet that demand, we must attract more students to study computer science. A major challenge for increasing the number of computer science graduates is the low participation of women.

Even as access to high school computer science courses increases, female participation remains low. At high schools offering advanced placement courses in computer science, only 23 percent of the students taking the exam are girls.

Research shows us that interventions at the high school level may come too late. Girls as young as 6 years old are internalizing gender-based stereotypes that discourage them from engaging in STEM activities, including computer science.

The Building Blocks of STEM Act directs the National Science Foundation to support research into factors that contribute to the early adoption of these stereotypes. The bill also directs the National Science Foundation to support the development of models for intervention to prevent or reverse the effects of these negative and false stereotypes.

I thank my colleagues Representatives STEVENS and BAIRD and Senators ROSEN and CAPITO for their leadership on this legislation, and I urge my colleagues to support this bill.

Mr. Speaker, I reserve the balance of my time.

Mr. LUCAS. Mr. Speaker, I yield myself such time as I may consume.

How appropriate that today the House is taking up S. 737, the Building Blocks of STEM Act, just as the Nation kicks off a celebration of Computer Science Education Week.

S. 737, the Building Blocks of STEM Act, is important, bipartisan legislation to improve science, technology, engineering, mathematics, and computer science, or STEM, education. It directs the National Science Foundation to support STEM research focused on early childhood education and to award grants to encourage young girls to pursue computer science learning. Studies have found that children who engage in scientific activities from an early age develop positive attitudes toward science and are more likely to pursue STEM expertise and careers.

Across the country, the share of STEM jobs has expanded significantly, with STEM employment nearly doubling over the last 30 years. Currently, there are over half a million open computing jobs in the United States, in every industry and in every State. This demand is projected to grow at twice the rate of any other field, and America is failing to meet it.

We can succeed, though, and we can do it by encouraging children, particularly young girls, in STEM in early childhood and sustaining that interest as they grow.

More students with STEM degrees means more advanced American technologies and a more robust economy. But it is not just about the economy. STEM graduates have the potential to develop technologies that can save thousands of lives, jump-start a new industry, or even discover new worlds.

It has been shown that female students who learn computer science be-

fore college are 10 times more likely to major in it. By supporting more hands-on STEM engagement at younger ages, we are supporting and investing in America's future.

I thank Representative BAIRD and Representative STEVENS for their leadership on this bill. The House previously passed this legislation in July and sent it to the Senate for consideration. We are considering it again today with some minor changes from our Senate colleagues.

I encourage my colleagues to again support this legislation and send it to the President's desk for his signature.

Mr. Speaker, the love of learning starts young, and the Building Blocks of STEM bill promotes this by prioritizing a focus on early childhood STEM education. It gives us the opportunity to encourage girls to get involved and stay engaged in STEM, helping us improve our educational programs and diversify the STEM workforce.

Again, I thank Representative BAIRD and Representative STEVENS for leading this bipartisan bill. As the House did in July, I encourage this body to again support and unanimously pass this legislation and send it to the President's desk for his signature.

Mr. Speaker, I yield back the balance of my time.

Ms. JOHNSON of Texas. Mr. Speaker, I would like to express my appreciation for the leadership of Representatives STEVENS and BAIRD; Senators ROSEN and CAPITO; and the ranking member, Mr. LUCAS. I urge that we pass this important piece of legislation.

Mr. Speaker, I yield back the balance of my time.

Mr. BAIRD. Mr. Speaker, I rise in support of S. 737, the Building Blocks of STEM Act.

I was proud to join my colleague, the Chair of the Research and Technology Subcommittee, Representative Haley Stevens in introducing the House version of this legislation, which unanimously passed this Chamber in July, and am pleased to be speaking today on the nearly identical Senate version of the bill.

As one of only two members of Congress with a PhD in science, I understand the importance of teaching STEM concepts and principles at an early age.

Fostering the natural curiosity that children possess is critical to expanding their interests in science, technology, engineering, and math. Research confirms that kids as young as one, two, or three are capable of absorbing STEM concepts.

Equally important is ensuring that we get more girls involved in the STEM fields, so that we have as many people as possible contributing to the knowledge base of our society.

Like the House version, S. 737 directs NSF to fund research and grants that focus on early childhood and young women in STEM at the K through 12 level.

This bill helps ensure we are preparing our future workforce to fill the jobs of the future.

By passing this important legislation we will continue America's global leadership in science and technology.

I ask my colleagues to support the bill and send it to the President's desk for his signature.

The SPEAKER pro tempore. The question is on the motion offered by the gentlewoman from Texas (Ms. JOHNSON) that the House suspend the rules and pass the bill, S. 737.

The question was taken; and (two-thirds being in the affirmative) the rules were suspended and the bill was passed.

A motion to reconsider was laid on the table.

## IDENTIFYING OUTPUTS OF GENERATIVE ADVERSARIAL NETWORKS ACT

Ms. JOHNSON of Texas. Mr. Speaker, I move to suspend the rules and pass the bill (H.R. 4355) to direct the Director of the National Science Foundation to support research on the outputs that may be generated by generative adversarial networks, otherwise known as deepfakes, and other comparable techniques that may be developed in the future, and for other purposes, as amended.

The Clerk read the title of the bill.

The text of the bill is as follows:

H.R. 4355

*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 "Identifying Outputs of Generative Adversarial Networks Act" or the "IOGAN Act".*

### SEC. 2. FINDINGS.

*Congress finds the following:*

(1) Research gaps currently exist on the underlying technology needed to develop tools to identify authentic videos, voice reproduction, or photos from manipulated or synthesized content, including those generated by generative adversarial networks.

(2) The National Science Foundation's focus to support research in artificial intelligence through computer and information science and engineering, cognitive science and psychology, economics and game theory, control theory, linguistics, mathematics, and philosophy, is building a better understanding of how new technologies are shaping the society and economy of the United States.

(3) The National Science Foundation has identified the "10 Big Ideas for NSF Future Investment" including "Harnessing the Data Revolution" and the "Future of Work at the Human-Technology Frontier", in which artificial intelligence is a critical component.

(4) The outputs generated by generative adversarial networks should be included under the umbrella of research described in paragraph (3) given the grave national security and societal impact potential of such networks.

(5) Generative adversarial networks are not likely to be utilized as the sole technique of artificial intelligence or machine learning capable of creating credible deepfakes and other comparable techniques may be developed in the future to produce similar outputs.

### SEC. 3. NSF SUPPORT OF RESEARCH ON MANIPULATED OR SYNTHESIZED CONTENT AND INFORMATION SECURITY.

*The Director of the National Science Foundation, in consultation with other relevant Federal agencies, shall support merit-reviewed and competitively awarded research on manipulated or synthesized content and information authenticity, which may include—*