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The Congressional Science, Technology, Engineering, and Mathematics (STEM) Education Caucus and the Congressional Academic Competition: History and Current Practice

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Summary

In February 2013, the House of Representatives announced that there will be an annual Congressional Academic Competition for Science, Technology, Engineering, and Mathematics (STEM) Education. The aim of the competition is to promote entrepreneurship and innovation. The annual competition is open to any enrolled high school or homeschooled student in a participating congressional district.

The first Congressional Academic Competition focuses on developing applications for mobile, tablet, and computer platforms. The 2014 competition is known as the House Student App Challenge. Recognizing that technology changes over time, the focus of the competition is intended to evolve in the future.

This report includes a brief history of the Congressional STEM Education Caucus, the legislation that created the competition (H.Res. 77), and the rules and regulations for conducting the competition in a congressional district.

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Congressional STEM Education Caucus

In the 108th Congress (2003-2004), Representatives Vernon Ehlers and Mark Udall[1] launched what was then known as the bipartisan Science and Math (STEM) Educational Caucus. The caucus has been registered as a congressional Member organization (CMO) in the House of Representatives under a variety of names since its debut.[2] In this report, the caucus will be referred to as the Congressional STEM Education Caucus. For a list of the caucus name variants and the co-chairs, see **Appendix A**, **Table A-1**.

The caucus seeks to strengthen STEM education at all levels (K-12, higher education, and the workforce) by providing a forum for Congress and the science, education, and business communities to discuss problems and solutions related to STEM education. The focus on STEM education was due in part to a report to Congress that warned of perceived weaknesses in the existing U.S. STEM education system. The report,[3] published by the National Academies, stated that without improved performance and participation in STEM fields, national prosperity and power may be threatened. For a detailed analysis of U.S. STEM education, see CRS Report R42642, *Science, Technology, Engineering, and Mathematics (STEM) Education: A Primer*, by Heather B. Gonzalez and Jeffrey J. Kuenzi.

House STEM Competition

Legislation

On February 26, 2013, Representative Candice Miller, chair of the House Committee on House Administration, introduced H.Res. 77, the Academic Competition Resolution of 2013. (See **Appendix B**.)[4] The Academic Competition has alternately been referred to as the House Academic Competition, the STEM Competition, and the Congressional STEM Competition. In this report, it will be referred to as the Congressional STEM Competition.

The competition is loosely modeled after the Congressional Art Competition[5] but was organized under different rules with regard to funding.

[1] Mr. Udall now serves in the U.S. Senate.

[2] See http://cha.house.gov/member-services/congressional-memberstaff-organizations.

[3] National Academy of Sciences, National Academy of Engineering, and Institute of Medicine, Committee on Prospering in the Global Economy of the 21st Century: An Agenda for American Science and Technology, and Committee on Science, Engineering, and Public Policy, *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future* (Washington, DC: National Academies Press, 2007).

[4] The text is also available at http://www.gpo.gov/fdsys/pkg/BILLS-113hres77eh/pdf/BILLS-113hres77eh.pdf. The resolution and House floor debate are in the *Congressional Record* vol. 159, part 27 (February 26, 2013), pp. H-643-H649.

[5] See CRS Report R42487, *The Congressional Arts Caucus and the Congressional Art Competition: History and Current Practice*, by Jerry W. Mansfield.

Regulations

On November 20, 2013, the Committee on House Administration adopted the regulations governing the Congressional STEM Competition. (See **Appendix C**.)[6] The regulations address the technology platform for the app; conduct of the competition; use of a disclaimer on endorsements; use and characteristics of apps; and specific information to assist the participating congressional districts, such as use of the franking privilege, Member Representational Allowance (MRA), advertising, gifts and awards, and use of personal funds to supplement the MRA.

Rules

As indicated earlier, the first Congressional STEM Competition focuses on the creation of a useful app. The 2014 competition is called the House Student App Challenge. The rules for the House Student App Challenge were issued on January 8, 2014, and clearly define who may participate, how to determine if a specific district has opted to participate, and how to enter. The rules also address judging criteria, winner selection, verification, prizes, publicity, and limitations of liability.[7]

The 2014 House Student App Challenge

Congressional offices had until January 31, 2014, to register as a participant in the House Student App Challenge—the first Congressional STEM Competition to promote innovation in the fields of science, technology, engineering, and mathematics. As of the closing date, 137 Members had registered for the competition. The competition ends on April 30, 2014, and on May 30, 2014, participating Members will submit their district winners to the House. The district winners will be posted on House.gov.

Eligibility

Any student who lives in or is eligible to attend high school in a participating congressional district may compete. This includes students who are homeschooled. Participants must be 13 years old as of February 1, 2014. Teams may participate but team size is limited to four students, two of whom must reside in or be eligible to attend high school in the congressional district.

Registration

Interested students may register on Challenge.gov[8] between 12:00 p.m. (EST) on February 1 and 12:00 p.m. (EDT) on April 30, 2014. A designated congressional staff member in a participating

[6] The text of the 2014 Congressional Academic Competition is also available at https://housenet.house.gov/serving-constituents/stem-competition/documents.

[7] Ibid.

[8] See https://challenge.gov. The Challenge.gov website is a collection of challenge and prize competitions run by more than 50 federal agencies. These competitions help the federal government to identify innovative solutions created by the public. Challenge.gov is administered by the U.S. General Services Administration.

Member's office is available to assist students with the registration process on Challenge.gov. Once a student registers on Challenge.gov, he or she is directed to ChallengePost.com for further information and instructions on how to submit the demonstration video.

Submission of App

Students are to submit a three-minute demonstration video of their app along with an entry form on ChallengePost.com. ChallengePost supports YouTube and VIMEO. Because the entry may be solely judged on what appears in the video submission, applicants are advised to demonstrate the scope and quality of their app succinctly in two minutes followed by a one minute description of how they created the app and what they learned as a result of the process. All submissions must be in English and applicants must also allow for the source code for the app to be available for inspection by the judges. An individual may appear on only one entry either alone or as part of a team. Once the submission period has ended, the submitted app cannot be modified in any way.

Conducting the Challenge

Congressional office coordinators of the Congressional STEM Competition were advised to connect with teachers in the district to solicit participation and to set up educational events. These events may include STEM fairs or other related promotional activities in the district. In addition, the offices were advised to promote the event on the participating Member's website, social media, ads, etc.

Congressional staff is responsible for selecting experts to act as advisors and judges and determining the criteria for winning entries. Once the submission deadline for apps has passed, staff will meet with judges to monitor the progress of the judging. The program recommends that staff take an active role in the post-submission phases of the competition by reviewing the videos selected for in-person judging, arranging for the final judging event, winner selection, and the awards ceremony. The staff will notify the Committee on House Administration of the winner and provide the winning entry and background materials for House posting.

An instructional aid called the STEM District Tool Kit-Local Roles has been created to assist congressional staff with conducting the competition in the district.[9] Additionally, multiple resources are available on HouseNet under the heading "Resources for Students and Teachers," including guides to teach kids programming, self-taught code writing courses, and a tutorial for developing apps on Android phones and in Apples and Windows environments.[10]

Judging

Members are free to select judges of their choice and the judges are not required to reside or work in the congressional district. The app challenge rules suggest that the apps be scored according to the quality of the idea, including creativity and originality; implementation of the idea, including

[9] See https://housenet.house.gov/sites/housenet.house.gov/files/documents/District%20Toolkit%20-%20Local%20Roles.pdf.

[10] See http://onlinecao.house.gov/housenet-multimedia/code/stem-member-page.txt.

user experience and design; demonstrated excellence of coding and programming skills; and impact. According to the rules, the judges may make determination solely on the demonstration video in which the app is running and demonstrating all of its features. The apps are not required to be demonstrated in-person. Entries that are conceptual and do not have a working program may be considered. If any Member elects to have entries judged as a concept, the contestants in that Member's district will be notified. The judging is scheduled from May 1 to May 30, 2014.

Recognizing Winners

Winners may be recognized by the Member in a district awards ceremony, and although it will be the Member's prerogative to have second or third place winners, there will only be one overall district winner. The overall winner from each district will be featured on House.gov and Challenge.gov followed by recognition through a display in the Capitol honoring all district winners. No official Washington, DC, ceremony will be scheduled at the end of the competition. However, individual Members of Congress may elect to hold an awards ceremony in the district.

The Member determines the amount of the MRA that will be used for the competition. In general, the MRA may be used to promote, advertise, and administer the competition. Prizes authorized by the Members' Handbook include certificates, folders, and frames of nominal value. (See **Appendix D**.)[11]

Congressional Co-Chairs

The co-chairs for the House Student App Challenge are Representative Bob Goodlatte (R-VA) and Representative Anna Eshoo (D-CA). Representatives Goodlatte and Eshoo are also co-chairs of the long-standing Congressional Internet Caucus.

[11] The Resources for the Conduct of the 2014 Competition are also available at https://housenet.house.gov/sites/housenet.house.gov/files/documents/Resources%20for%20App%20Competition%20V1.0.pdf.

Appendix A. Congressional Science, Technology, Engineering, and Mathematics (STEM) Education Caucus

Table A-1. Congressional Science, Technology, Engineering, and Mathematics (STEM) Education Caucus Leadership, 2003-Present

Year/Congress	Caucus Name	Member Co-Chairs	Party/State
2003-2004 (108th Congress)	Science and Math (STEM) Educational Caucus	Representative Vernon Ehlers Representative Mark Udall	R-MI D-CO
2005-2006 (109th Congress)	House Science, Technology, Engineering, and Mathematics (STEM) Education Caucus	Representative Vernon Ehlers Representative Mark Udall	R-MI D-CO
2007-2008 (110th Congress)	House Science, Technology, Engineering, and Mathematics (STEM) Education Caucus	Representative Vernon Ehlers Representative Mark Udall	R-MI D-CO
2009-2010 (111th Congress)	House Science, Technology, Engineering, and Mathematics (STEM) Education Caucus	Representative Vernon Ehlers Representative Dan Lipinski	R-MI D-IL
2011-2012 (112th Congress)	Congressional Science, Technology, Engineering, and Mathematics (STEM) Education Caucus	Representative Dan Lipinski Representative Roscoe Bartlett	D-IL R-MD
2013-2014 (113th Congress)	Congressional Science, Technology, Engineering, and Mathematics (STEM) Education Caucus	Representative Dan Lipinski Representative Susan Davis Representative Richard Hanna Representative Randy Hultgren	D-IL D-CA R-NY R-IL

Source: Prepared by CRS from Committee on House Administration's Congressional Member and Staff Organizations, available at http://cha.house.gov/member-services/congressional-memberstaff-organizations.

Appendix B. Text of the Academic Competition Resolution of 2013

House Committee on Administration
Academic Competition Resolution of 2013

H.Res. 77

In the House of Representatives, U. S.,

February 26, 2013.

Resolved,

SECTION 1. SHORT TITLE.

This resolution may be cited as the ''Academic Competition Resolution of 2013''.

SEC. 2. FINDINGS.

The House of Representatives finds as follows:

(1) STEM (Science, Technology, Engineering, and Mathematics) fields and knowledge have been integral to the development of civilization over the centuries.

(2) STEM fields have been, and continue to be, vital to a healthy and thriving United States.

(3) STEM fields are even more important in a world and nation of continuous and rapid technological advancements and needs.

(4) STEM fields are necessary to ensure a qualified national workforce and growing American economy, and a recent study predicted that one-half of all STEM jobs in 2020 will be related to the field of computer science.

(5) A recent study found that less than one-third of eighth graders in the United States showed proficiency in mathematics and science.

(6) A recent study found that only 9 States allowed computer science courses to count toward high school students' core graduation requirements.

(7) A recent study found that only one-third of the bachelor's degrees earned in the United States are in a STEM field.

(8) A recent study found that more than one-half of the science and engineering graduate students in institutions of higher education in the United States are from outside the United States.

(9) Efforts to encourage students to work in STEM fields will enhance collaborative efforts between our secondary education systems and STEM-related fields and industries.

(10) The global economy demands that the United States continue to lead the world in innovation, creativity, and STEM-related research.

(11) Bringing together Members of Congress and their younger constituents to participate in activities that will result in a deeper appreciation for STEM fields will foster enthusiasm for education in the sciences.

(12) The support which students will gain through Congressional recognition of their work on STEM-related projects will encourage them to pursue career paths in STEM studies and research.

(13) It is appropriate for the House of Representatives to institute a new and worthwhile competition to encourage students to participate in STEM studies and research.

(14) Rapid technological change means the competition will evolve over time and will challenge students in specialized areas of science, technology, engineering and math to ensure maximum participation. Because of the importance of computer science it would be appropriate to initially challenge students to develop so-called ‘‘apps’’ for mobile, tablet, and computer platforms.

SEC. 3. CONGRESSIONAL COMPETITION IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS.

(a) ESTABLISHMENT OF COMPETITION.—There is hereby established an academic competition in the fields of science, technology, engineering, and mathematics which shall be held each year among students in each Congressional district.

(b) REGULATIONS.—The competition under this resolution shall be carried out in accordance with such regulations as may be prescribed by the Committee on House Administration, except that the regulations shall permit the office of a Member to seek guidance from outside experts in the fields of science, technology, engineering, and mathematics for the purposes of establishing criteria for the selection of competition judges and for the judgment of competition submissions.

Appendix C. Regulations for the Academic Competition

Figure C-1. Regulations for the Academic Competition

Committee Resolution

COMMITTEE ON HOUSE ADMINISTRATION

113TH CONGRESS

COMMITTEE RESOLUTION 113-6

Resolution to Approve Regulations for the Academic Competition

***Whereas*,** pursuant to House Resolution 77, the Academic Competition Resolution of 2013, the House of Representatives directed the Committee on House Administration to adopt regulations governing the Academic Competition,

Whereas, as technology changes, the competition will evolve over time and will challenge students in specialized areas of science, technology, engineering and math. The competition will initially challenge students to develop so-called "apps" for mobile, tablet, or computer devices,

Therefore, be it ***Resolved***, that the Committee adopts the following regulations:

Regulations for the Academic Competition

Title 1. Regarding the App.

Platform
Students in the competition may choose a generally available technology platform, such as a mobile, tablet, or computer device, on which to develop their submissions.

Conduct of Contest
The Committee on House Administration shall appoint a Member or group of Members to serve as chairs or co-chairs of the Academic Competition. The Committee on House Administration may also appoint an outside group of experts in the STEM fields to assist the chair or co-chairs in setting guidelines and rules for the Academic Competition. All such guidelines and rules must be approved by the Committee on House Administration.

The rules shall include provisions on name of the contest; the periods of the contest; the appointment of judges; and any other provision necessary for the conduct of the competition.

Disclaimer on Endorsement
The House of Representatives does not endorse or recommend any commercial products, process, or services. For the period of the academic competition and the display of the

submissions by the House, a contestant may not seek to market or manufacture the submitted app for commercial use. A contestant may not make any reference to the academic competition nor imply an endorsement from the House for the purpose of marketing or manufacturing the submitted app.

Use of app for Contest

By submitting an app for the academic competition, a contestant expressly agrees that for the period of the contest, submitted apps are available free of charge for the conduct of the competition. The apps will be judged by the Members or their designee(s) and displayed by the House during that period. The contestant retains ownership rights of the submitted app.

Characteristics of Apps

Submitted apps may not be indecent, immoral, defamatory, vulgar, pornographic, in obvious bad taste, or demonstrate a lack of respect for public morals. Submitted apps may not be illegal under applicable federal and state laws.

Title 2. District Contest

Resources

The Member office may operate the district competition using only the MRA or personal funds. In accordance with House Rules, the Member office may not accept any outside support or funding in conducting the competition and awards program except as specifically provided below.

Contestants

Contestants in the district competition must be eligible to enroll as students in a school located within the boundaries of the district from which the Member is elected. Contestants in the competition must be legal residents.

Judges

A Member office may seek advice from outside experts in the fields of science, technology, engineering, and mathematics for the purposes of establishing criteria for the selection of competition judges and for the judging of competition submissions. The Member will establish the judging process.

Outside Sponsors of the Competition

Member offices may not list an outside party as a co-sponsor or supporter. The office may not in any way endorse or promote a third party with official resources.

Franking

A Member office may use the frank to mail official information about the Academic competition, including but not limited to, the notification to students, recruitment of judges, rules, deadlines and notices of official events regarding the competition. A Member office must obtain an Advisory Opinion in order to mail 500 or more unsolicited pieces of mail or e-mail.

MRA

The Academic Competition is an official activity of the House. A Member office may use the MRA to hold an event to display and judge the submissions to the district competition. A Member office may also allow staff time and use of official resources to plan and conduct a district competition. Use of the MRA is subject to the limitations outlined by Title 2 of the U.S. Code and regulations promulgated by the Committee on House Administration.

Advertising

A Member office may purchase advertising for a competition event or for information about the Academic competition. The advertisement regulations in the Members Handbook apply.

Gifts and Awards

A Member office may provide authorized gifts or awards of nominal value as part of the Academic competition. Gifts authorized by the Members' Handbook include certificates, folders, and frames of a nominal value. Outside from the items listed above, an office may not use the MRA to purchase any other prizes as these are considered gifts.

Personal Funds

Subject to the rules and regulations of the House, Members may use their own personal funds to supplement the MRA and the costs of conducting a district competition.

Source: U.S. Government Printing Office. Available at http://docs.house.gov/meetings/HA/HA00/20131120/101530/BILLS-113pih-CommitteeResolutiontoApprovaRegulationsfortheAcademicCompetition.pdf.

Note: The Committee Resolution number for the regulations (i.e., 113-6) has been added to Figure C-1. The number -6 is missing from the original source document.

Appendix D. Resources for the Conduct of the Challenge

Figure D-1. Resources for the Conduct of the Challenge

Resources for the conduct of the Contest	Status
Resource	
Use of the Frank	Yes
MRA Paid Advertisements	Yes
MRA Staff Time	Yes
MRA paid certificates, folders & frames	Nominal Value ok
Accept educational or training materials to assist staff in setting up and operating a contest, including training for participants and House staff	Yes
Designate an advisor in the selection of contest judges	Yes
Use House Web sites for contestants to register and submit contest entries	Challenge.GOV will be used instead
Use Challenge.GOV for contestants to register and submit contest entries	Yes
Member can solicit outside resources for travel & local contest support	NO
On behalf of the House, accept corporate advertising	NO
Record app submissions via on-line video	Yes
On behalf of the House, accept technology to Record app submission on virtual platform	NO
Display apps with video and web record	Yes
On behalf of the House, accept corporate technology to display winners	NO
Local winners travel to DC	No Solicitation
Outside group hosts national awards event	NO
Outside groups can solicit Offices to participate	Yes
Outside groups can host a public web site for purposes of training and education coordination	Yes
Public or generally free facilities; limited use of corporate facilities (day of training)	Offices can accept focused training for the contest.
Corporate training facilities (e.g. General Assembly, Startup Weekend, etc.)	Offices can accept focused training for the contest.
Software or development tools.	No free software or development memberships unless generally available (e.g. all high school STEM contestants)
Training District Office staff	Offices can accept focused training for the contest.
Weekly educational videos to teach how to develop an app.	Offices can accept focused training for the contest.
Non-profits education partners help find mentors	Offices can accept focused training for the contest timeframe permissible, but maintain training vice competing
50 page app development guide for Students: comprehensive guide including corporate and open source resources.	Should be broadly available
Coordinate with non-profits to outreach to teachers	No, Rule 24 prohibition on communicating on behalf of Congress.
Scholarships; free classes (a la Savanah Art Institute)	NO
Corporate donations such as programming tools	NO
Free passes for winners to attend educational conferences	NO

Source: https://housenet.house.gov/sites/housenet.house.gov/files/documents/Resources%20for%20App%20Competition%20V1.0.pdf.

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