



NATIONAL COUNCIL OF  
TEACHERS OF MATHEMATICS

June 15, 2012

OSTP Director John P. Holdren  
NSF Director Subra Suresh  
Committee on STEM Education  
National Science and Technology Council  
Executive Office of the President  
725 17th Street Room 5228  
Washington, DC 20502  
<http://www.regulations.gov/#!submitComment;D=NSF-2012-OTR-0002-0001>

Dear Drs. Holdren and Suresh:

Thank you for the opportunity to comment on the “Design Principles for Federal STEM Education Investments” from the National Science Foundation and the National Science and Technology Council. As you and your colleagues develop a five-year federal STEM education strategic plan to guide federal investments in STEM education, the National Council of Teachers of Mathematics (NCTM) offers the following comments on the Design Principles as conveyed in a Notice of Request for Public Comments, related to Docket ID NSF-2012-OTR-002.

Clearly, NCTM and its nearly 80,000 individual members focus on the “M” in STEM. A strong pre-K–12 mathematics education for all students is increasingly important to our nation’s economic stability, future national security, and workforce productivity. An economically competitive society recognizes the importance of mathematics learning and depends on citizens who are mathematically literate. NCTM believes that teachers and what they do in the classroom are at the heart of making this vision a reality.

NCTM supports investing in teachers at every stage of their development and welcomes a growing emphasis on early childhood education and the momentum behind the development and implementation of common standards and assessments. In addition, as the country struggles with a strained federal budget, NCTM believes that making strategic federal decisions about investments in the teaching and learning of mathematics is more important than ever.

As we review the Design Principles that will inform the final five-year strategic plan, NCTM offers the following comments:



### General comments

First, the proposed Design Principles do not address an issue that confounds the STEM education community: the establishment of a single, coherent, inclusive definition of the term STEM. Too often, using this term results in competing investments in the narrow disciplines represented by the four letters, ignoring interdisciplinary subjects or subjects that build on these disciplines, thereby defeating the purpose and intended goals of STEM. NCTM suggests that CoSTEM develop a definition that would apply to investments at all agencies and that would be universally understood, recognized, and accepted.

Second, the proposed design principles address “underrepresented groups” specifically, but do not explicitly address the challenges facing individuals with disabilities, English language learners, or students of low socioeconomic status and how programs should consider meeting the needs of these populations that are—or could be—served by federal STEM education investments. NCTM suggests that CoSTEM urge federal agencies to define how they will meet these students in ways that will foster interest and success in STEM disciplines. This should include providing support for educators so that they can teach these students effectively.

### Comments Specific to CoSTEM’s Proposed Design Principles

#### 1. *General Investment Design Principles*

*Investments should have a logic model and/or explicit theory of action that describes the targeted audience.* NCTM proposes adding the following bullet:

(x.) The target audience for the investment.

Management plans of investments plans should also consider how programs do or could collaboratively serve the same populations as they progress through the STEM education pipeline. NCTM proposes the following addition to the bullets addressing management plans:

(x.) In the case of investments that serve K–12 or undergraduate students, how the investment will be managed to leverage other investments and support a progression of educational and academic growth through the STEM pipeline.

#### 1. Design Principles by Primary Investment Objective

Regarding the bullets that address “b. Pre- and In-Service Educator/Leaders Performance,” NCTM believes it is critical to note the importance of supporting STEM educators by providing high-quality professional development and the tools needed to successfully teach and engage students with disabilities and English language learners in these proposals.



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Regarding the bullets that address “c. Postsecondary STEM degrees and STEM careers,” NCTM notes that often when policies are developed to encourage postsecondary STEM degrees and STEM careers, the field of teaching in the STEM disciplines is often discounted or ignored. NCTM believes that investments that address workforce needs should explicitly include the teaching workforce and policies that support the development of teachers in these crucial subjects in the P–20 pipeline.

We hope that you will consider these views as your work develops further. Thank you for the time and effort you and your staff are investing in improving STEM education. As this process moves forward, if you have any questions or if the Council can provide you with any additional information, please contact NCTM Associate Executive Director for Communications Ken Krehbiel at (703) 620-9840, ext.2102, or Della Cronin at (202) 289-3900.

Sincerely,

A handwritten signature in black ink that reads "Linda M. Gojak". The signature is written in a cursive style with a large initial 'L'.

Linda A. Gojak  
President