NIH and Science, Technology, Engineering, and Mathematics Education (nSTEM)

(primary focus on K-12)

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Why STEM Education?

- Researcher pipeline
- Strong correlations between mathematics achievement and subsequent economic, psychological, health-related well-being, and quality of life.
- Good numeracy skills associated with higher wages and greater use of preventive health care and behaviors.
- Greater literacy leads to better medical treatment compliance and better outcomes.
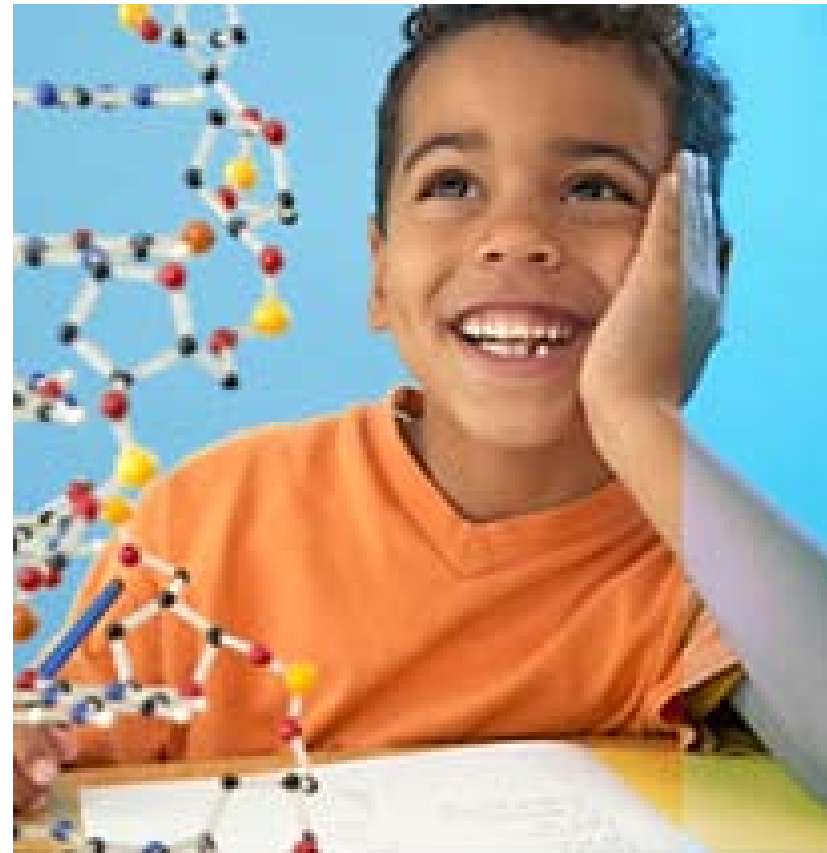
STEM Education Concerns

- For over 120 years the U.S. led the world on many measures of education *attainment*.
  - % population with high school diploma (Now not in top 20 nations)
  - % population with college degree (Now not in top 10 nations)
  - Began falling behind in the 1970's
- U.S. scores in the middle of industrialized world in international K-12 science and math.
- Negative consequences for U.S. economy, scientific enterprises, and middle class have already begun.
- Education is a complicated systems problem–will take decades to fix the things that are suboptimal.
- What is the optimal role for NIH?

Math, Science, and Problem Solving

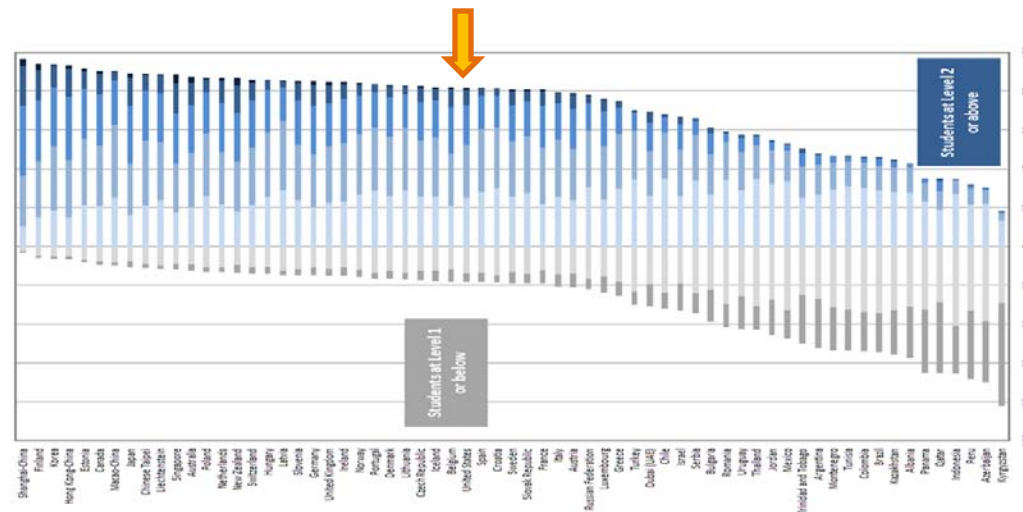Programme for International Student Assessment, 2009, 15yo

Math

Science

Shanghai China

Kirgizstan
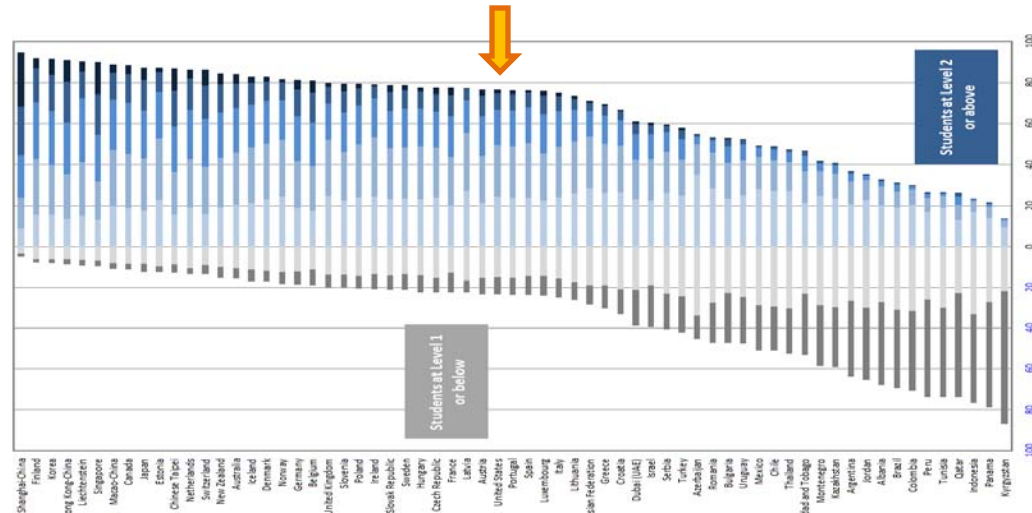
America COMPETES Reauthorization Act of 2010

Inventory of Federal STEM Education

Introduction

The America COMPETES Reauthorization Act of 2010 calls for OSTP to establish, maintain, and periodically update an inventory of federal investments in science, technology, engineering, and mathematics (STEM) education as part of a five-year federal STEM education strategic plan. To complete the inventory, OSTP is seeking information from federal departments and agencies. This inventory will capture information on STEM education investments to illustrate distinct program characteristics, create learning communities within and across federal agencies (for improving implementation and evaluation of education investments), identify areas of potential synergy across and within agencies, and support the development of a federal five-year strategic STEM education plan. The inventory process will occur on a cyclical basis to ensure that the information is up-to-date. The inventory will be accessible electronically by all agencies and will include a mechanism for staff to search for investments with specific characteristics. The search function is one mechanism that will promote learning communities and greater awareness of education investments within and across federal agencies.
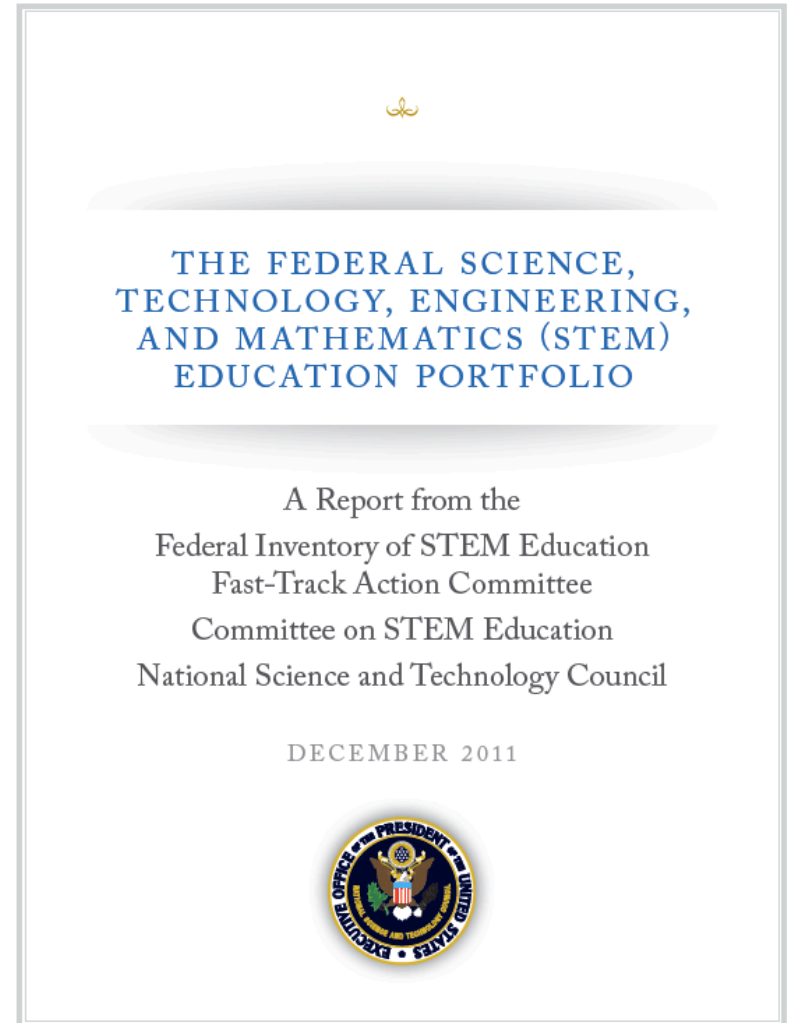
America COMPETES Reauthorization Act of 2010

- NSTC Committee on STEM Education (CoSTEM)
  - Subra Suresh - NSF
  - Carl Weiman - OSTP
  - NSTC Subcommittee for STEM Strategic Planning
    - Joan Ferrini Mundy - NSF
    - Leland Melvin - NASA
  - NSTC Subcommittee for the STEM Inventory
    - John Manahan - DoED
    - Bruce Fuchs - NIH

CoSTEM 5-Year Strategic Plan

- Public release expected September 2012
  - Focus on five major investment objectives
    - Learning and Engagement
    - Pre/In-service Educator and Leader Performance
    - Post-secondary STEM degrees and STEM careers
    - Institutional Capacity
    - Education Research and Development
  - STEM Education for Underrepresented Groups
    - Cuts across all of the above objectives

Federal STEM Education Portfolio

- Results of 2011 Survey of Investments

- 252 investments, $3.4B

- Modest overlap

- No duplication

- Survey updated every year

- http://1.usa.gov/uYCfAa

THE FEDERAL SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS (STEM) EDUCATION PORTFOLIO

A Report from the
Federal Inventory of STEM Education
Fast-Track Action Committee
Committee on STEM Education
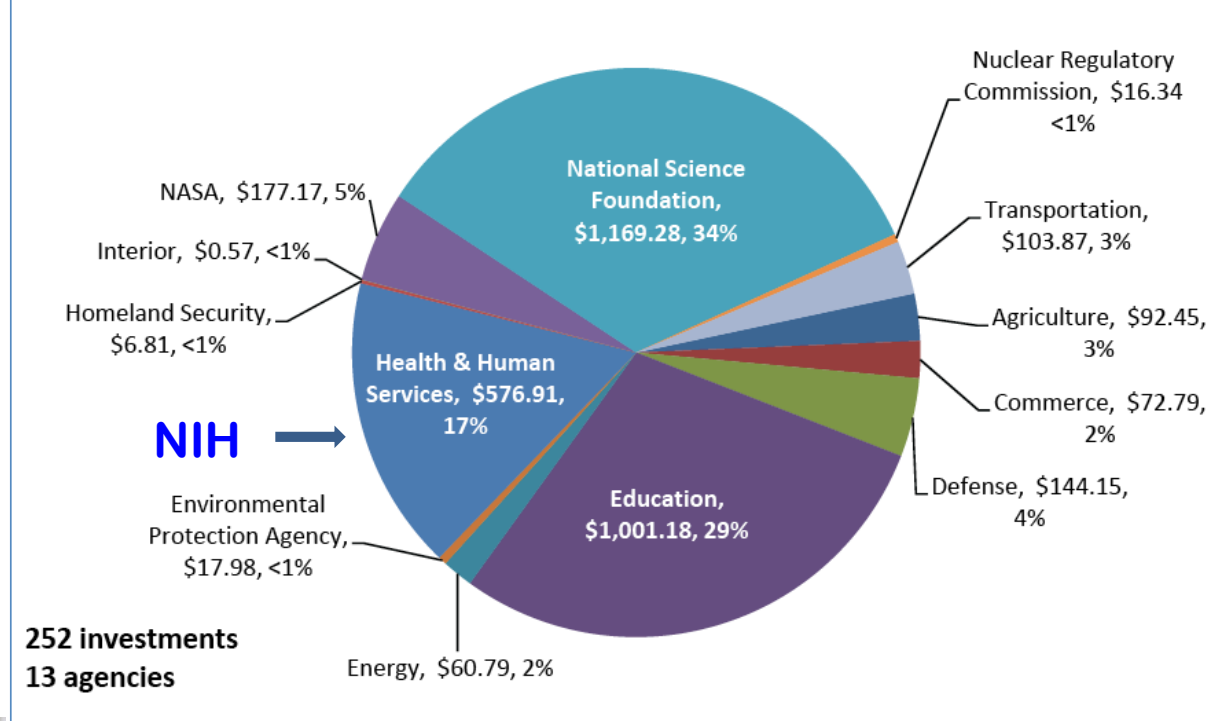National Science and Technology Council

DECEMBER 2011

Inventory for FY2010 STEM Investments
Total National ($1.1T)
Federal $3.44B

- 13 agencies invested >$3.4 billion in 252 programs designed to increase knowledge of/degrees in STEM fields
- HHS, DOE, and NSF administered >1/2 of these programs

Federal STEM Education Investments by Agency ($3,440 M)

- National Science Foundation, $1,169.28, 34%
- Nuclear Regulatory Commission, $16.34 <1%
- NASA, $177.17, 5%
- Transportation, $103.87, 3%
- Interior, $0.57, <1%
- Agriculture, $92.45, 3%
- Homeland Security, $6.81, <1%
- Health & Human Services, $576.91, 17%
- Commerce, $72.79, 2%
- **NIH** →
- Defense, $144.15, 4%
- Education, $1,001.18, 29%
- Environmental Protection Agency, $17.98, <1%
- Energy, $60.79, 2%

252 investments
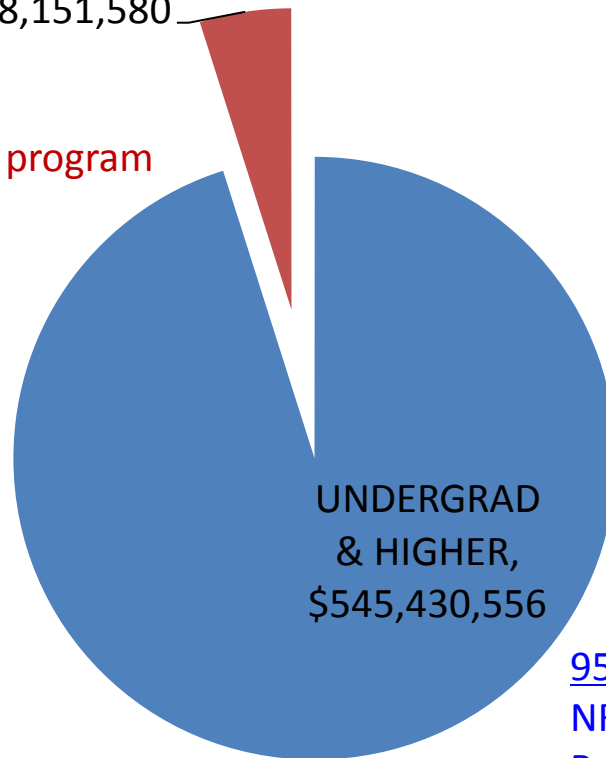13 agencies

Where are NIH's STEM Investments?

5% for K-12
SEPA program
NIH Challenge grants
Science education drug abuse program
NIAID education awards

K-12 , $28,151,580

UNDERGRAD & HIGHER, $545,430,556

95% to Undergrad and higher
NRSAs
Research Supplements
Cancer Education, Career Enhancement
Undergrad & other Grad Education

Consolidation of Education Expertise in ORIP

Office of Science Education	Science Education Partnership Awards
• Initiatives for students in grades K - 16, educators, parents, and general public • Evaluates research and emerging trends in science education and literacy for policy making • Works with NIH ICs, other public and private organizations to develop and coordinate activities • Develops free curriculum supplements, video resources, career exploration… • Products aligned to state standards	• To improve life science literacy through innovative educational programs • Partnerships with scientists, clinicians, educators, community organizations and science centers • Goals to increase participation of a diverse population of young people in clinical and basic research careers • Educates the public about NIH-funded research and the link between lifestyle and health • Funds grants to achieve these goals

Path Forward

- Time to reconsider how NIH can best support national STEM efforts within the agency's mission and resources
- Focus on OSE and SEPA
  - 5-year Strategic Plan expected to be released September
  - STEM Education for Underrepresented Groups
- ACD WG reports on the Workforce and on Diversity expected in June 2012

WG Charge

- Request approval to establish a Council Working Group to provide advice and recommendations on:
  - Priorities for the areas, activities and opportunities where NIH is uniquely positioned to advance STEM education compared with other agencies and groups;
  - How OSE and SEPA could have the greatest impact to enhance and coordinate current or new NIH activities in K-12 STEM education;
  - The role of OSE and SEPA in public education; and
  - Leveraging existing resources and expertise within and outside of NIH to achieve the most significant and mission–focused impact.

Process

- Inventory and evaluate current NIH activities in STEM education and how they address the NIH mission and relate to the activities of other agencies and groups
- Seek input from experts and stakeholders such as NIH leadership, relevant federal and state agencies, educators, education researchers and the public.

Timeline

- To start once OSTP releases 5-yr strategic plan (probably September)
- Present report and recommendations to the full Council of Councils in a timeframe that positions the Council to complete its recommendations to the NIH Director and DPCPSI Director by Summer 2013.

Asking for A Motion

To establish a Working Group of the Council of Councils to advise on NIH's education efforts (nSTEM)

nSTEM Working Group Membership

- Will be looking for volunteers

- Council members interested in co-chairing or participating contact DPCPSI

- Anticipate several meetings with experts

QUESTIONS?