Education at NASA

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The nation that out-educates us today will out-compete us tomorrow.

- President Barack Obama
Speech to the National Academy of Science
April 27, 2009
US Global Rank on Science

1. Finland
2. Hong Kong
3. Canada
4. Chinese Taipei
5. Estonia
6. Japan
11. Korea
12. Slovenia
13. Germany
14. United Kingdom
26. Croatia
28. Latvia
29. United States

Source: OECD 2007 Executive Summary PISA 2006: Science Competencies for Tomorrow’s World
Educate the next generation with 21st century knowledge and skills while creating a world-class workforce. (Executive Office of the President, Strategies for American Innovation, September 2009)

- Quantity, quality, and diversity of math and science teachers
- Students prepared for STEM related careers
- Educational opportunities for women and minorities – White House Council on Women and Girls
- Expand access to higher education and training
- Fellowships and interdisciplinary graduate programs
- Supporting future entrepreneurs
- Scientific innovation

“It is the sense of Congress that NASA's educational programs are important sources of inspiration and hands-on learning for the next generation of engineers and scientists and should be supported.” (H.R. 6063 NASA Authorization Act of 2008)
NASA Education Overview

Strategic Framework

Higher Education
Outcome 1: Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals, through a portfolio of investments.

Informal Education
Outcome 3: Build strategic partnerships and linkages between STEM formal and informal education providers that promote STEM literacy and awareness of NASA's mission.

Elementary/Secondary Education
Outcome 2: Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers and faculty.

Cultivate Diversity of Workforce Disciplines and Practitioners

Employ
Educate
Engage
Inspire

Principles/Criteria

Relevance NASA Content Diversity Evaluation Continuity Partnerships/Sustainability

* Science, Technology, Engineering and Mathematics (STEM)
Talented, diverse, and highly-skilled science & engineering future workforce

NASA’s Workforce Contribution

Public

Informal STEM Education
Science Centers and Museums
NASA Visitor Centers
Community Based Organizations

NASA STRATEGIES: Partnerships and networks

K-12 STEM Education
STEM Student Opportunities
STEM Teacher Development

NASA STRATEGIES: Educator Professional Development Education Technology

K-12

Undergrads

Higher Ed STEM Education
STEM Opportunities
Space Grant
EPSCOR
MUREP

NASA STRATEGIES: Research and authentic experience, Institutional Dev

Graduate Students

Grad Higher Ed STEM Education
STEM Opportunities
Space Grant
EPSCOR
MUREP

NASA STRATEGIES: Research, Institutional Development

NASA Civil Service
NASA Contractors
NASA PIs (Universities)
AA for Education Chair

Budget, Reporting, New Initiatives

ECC

OE (Deputy AAs)

Mission Directorates (4)
ARMD, ESMD, SOMD, SMD

Field Center Ed Directors (10)
ARC, DFRC, GRC, GSFC, JPL,
JSC, KSC, LaRC, MSFC, SSC

Functional Offices
EO, Human Cap.
PAO, OLIA, OER
Astro Office

Project Implementation
Field Centers, Grantees,
Contractors
First Steps to a STEM Career
51% of Higher Education students are employed by NASA, aerospace contractors and education institutions (+27% other STEM)

83% of educators in NASA training use resources in the classroom

44% of undergraduate students move on to advanced education

1,483,362 K-12 students engaged

400+ Museums and Science Centers are actively using NASA content
FY11 Overview

• The FY 2011 budget request for Education totals $145.8 million.

• Furthers NASA’s commitment to inspiring students in STEM.

• Supports Administration's STEM education teaching and learning improvement efforts, including Race to the Top and Educate to Innovate

• Continues high school, undergraduate and graduate internships/fellowships.

• Expands teacher pre-service, professional development and training programs.

• Creates new “Innovation” competitive opportunities in FY 2011
  – Innovation in Higher Ed STEM Education (to include launch opportunities)
  – Global Climate Change (to engage community colleges and minority institutions)
  – K-12 STEM Education (to include formal and informal education approaches)
**Innovation in K-12 Education (NEW in FY 2011)**

**Competitive Grants** support innovations in STEM teaching and learning through use of NASA content and resources.

**Funding for proof of concept approaches**, STEM education research, education technologies, widespread student engagement and education activities

- Identifies new strategies, approaches, incorporation of latest research findings
- Allows NASA to evaluate activities/efforts for future funding opportunities
- Fosters collaborative relationship between NASA and partners
Summer of Innovation (piloted in FY 2010)

- Intensive STEM teaching and learning project piloted in summer 2010
  - To reach 100,000 STEM underperforming middle school students; 5,000 STEM educators
  - Students will achieve STEM proficiency and increase interest in STEM careers
- Strategically infuses NASA content in proven summer learning programs

- Awards managed by Space Grant consortia in partnership with state, district, local education systems, informal education institutions

- Aligned with goals and outcomes of “Educate to Innovate”, “Race to the Top” and “Investing in Innovation” initiatives.

- Funded with $10M of the FY 2010 Congress appropriation for competitive grants to support K-12 education
• Increases the participation of underrepresented and underserved students in NASA global climate change education and research

• Targets students and educators from minority serving institutions and community colleges
  – Managed through NASA’s Minority University Research and Education Program (MUREP)

• Consistent with
  – Recommendations of the National Research Council’s report *Earth Science and Applications from Space: National Imperatives for the Next Decade and Beyond*

• Partnerships in development include NSF, NOAA, Department of Energy
Increases student access to NASA mission content, flight and mission participation opportunities

Develops the future STEM workforce

Targeted to undergrads, graduate students, and faculty

Will include high school to undergraduate transition activities

Initial projects include

- *One Stop Shopping Initiative (OSSI) for NASA Internship/Fellowship Opportunities* increases visibility of all student opportunities, streamlines application processes
- *NASA Student Ambassadors Virtual Community* fosters interaction and mentorship among NASA interns through an interactive web-based community
- International Space Station research opportunities
Spring 2010 Pilot

• Actively engaged schools and partners to deliver unique and authentic NASA content to middle and high school students

• Schools use measures of student involvement, increases in STEM proficiency, extracurricular activities to gain NASA incentives and awards

• Educators receive professional development and share experiences/best practices through an on-line community

• Collaborators include NSTA, ITEA, Successful Schools Network, U.S. Department of Education
Our Unique People and Missions CAN TOUCH THE WORLD
FY09 NASA Education Funding by Outcome
Total: $200,185,816

*Crosscutting costs include conference support, liens, database development, evaluation, etc.
FY09 NASA Education Funding by Source
Total: $200,185,816

- Office of Education: $169,200,000, 84%
- Mission Directorates: $23,763,119, 12%
- Centers: $7,222,697, 4%