A NATIONAL PARTNERSHIP-BASED SUMMER LEARNING INITIATIVE TO ENGAGE UNDERREPRESENTED STUDENTS WITH SCIENCE, TECHNOLOGY, ENGINEERING & MATHEMATICS

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Education Landscape

Achievement-level results in NAEP science at grades 4, 8, and 12: 2009

...a National Imperative
Educate to Innovate

National Campaign launched by President Obama

• Increase STEM literacy
• Move American students to the top
• Expand opportunities for underrepresented groups, including women and girls

NASA’s Response

• Summer of Innovation Pilot Project
• Middle School Students
• Underrepresented, Underserved, Underperforming
• Multi-week STEM experiences
“As Only NASA Can”

NASA Education Strategic Framework
A Clearly Defined and Coordinated Portfolio Approach

Outcome 1
Contribute to the development of the STEM workforce in disciplines needed to achieve NASA’s strategic goals through a portfolio of investments.

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

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

Principles/Criteria
- Relevance
- NASA Content
- Diversity
- Evaluation
- Continuity
- Partnerships/Sustainability

Cultivate Diversity of Workforce Disciplines and Practitioners
Organization

Notional Management Structure

- Multi-Faceted Approach
- STEM Learning Communities
- Infusion of NASA Content
- Evaluation
- Teacher Professional Development
- Student Engagement

Project Objectives
- Student Engagement
- Infusion of NASA Content
- Teacher Professional Development
- STEM Learning Communities
- Evaluation

Project Support Elements
- Communication, Awareness and Messaging
- Project Assessment
- Performance Monitoring, OEPM
- Project Management Infrastructure

Project Components
- Space Grant Awards
- Contract Award
- Center Collaborations
- Partnership Development
- National Call
Project Objectives

1. Professional development and training opportunities for teachers who will lead students through the *Summer of Innovation* summer learning program.

2. An intensive and interactive middle school education experience that accelerates student learning and improves student STEM skills and knowledge.

3. Strategic infusion of NASA content and educational resource materials.

4. A community of STEM education stakeholders that is able to sustain student interest and achievement.

5. Assessments of effectiveness of *Summer of Innovation* interventions and the effectiveness of the STEM learning communities developed through this pilot.
Project Components: Space Grant

- Wyoming Space Grant -- "Powering STEM Education in Wyoming with Wind Energy"
- New Mexico Space Grant -- "Launch and Learn"
- Idaho Space Grant -- "NASA Education and STEM Program for Underrepresented Populations"
- Massachusetts Space Grant -- NASA robotic, Earth and space science, astrophysics and engineering missions.
Project Components: Centers

10 Centers Funded for Targeted Areas in their Regions
Imagine It!     Explore It!     Do It!

Project Components: Sub-Award

Sol task to existing NASA STEM education contract

Sub-Award Sol Sites

- Chicago, Illinois
- Cleveland, Ohio
- Columbus, Ohio
- Dayton, Ohio
- Detroit, Michigan
- Los Angeles, California
- Orlando, Florida
- Sharon, Pennsylvania
- Toledo, Ohio
- Youngstown, Ohio
Project Components: Partnerships

STATUS

• Federal Agencies Partnership in Initial Development Stage
  – FAA, ED, NSF

• Non-profit Partnerships in Initial Development Stage
  – Conrad Foundation
  – NFL Players Association
  – Great Minds in STEM
  – Foundation for the Advancement of Women Now (FFAWN - Mary J. Blige)
  – Mathematics Engineering and Science Achievement (MESA)
  – Micro Enterprise Charter Academy (MECA)
  – One Hand to Another (Pharrell Williams)

• Industry in Initial Development Stage
  – Mad Science
  – Bionic Yarn

PLANNED ACTIVITIES

• Partnership Summit
• OGC discussion on levels of engagement (SAA, MOU, collaborator, etc.)
• Announcement of Opportunity, OGC Approval June 15, will be posted on SoI Web site and FedBizOps
**DESCRIPTION**

The National Call is an entry point for STEM Stakeholders to participate in the NASA SoI and become STEM Collaborators.

- Facilitates incorporation of NASA content into summer learning activities nationwide.
- Families, educators & organizations register online.
- Submit Events/Activities to Calendar and Map.
- Receive NASA SoI Certificate of Participation.
- Share a photo and Summer of Innovation story.

**STATUS/SUMMARY OF ACTIVITIES**

- Launched SoI Website June 8.
- Paper Work Reduction Act (PRA) Determination discussion continues.
- National Kickoff broadcast via NASA TV.

**PLANNED ACTIVITIES**

- Meeting with OMB/OSTP website on registration and evaluation.
- Work with OMB examiner to obtain Emergency Clearance to collect Web registration data.
- Website (Phase 2) Additional Functionality.

**2010 MILESTONES**

- Concept Development – April/May.
- Define Website requirements – May/June.
- NASA IT, Privacy Act, Paper Work Reduction Act Compliance activities May/June.
- Website Phase 1 Launch – June 8.
- Website Phase 2 Release – July 8 (tentative).
- Monitoring of Web Usage/Data (weekly).
- National Call Review – October/November.
## Approach

<table>
<thead>
<tr>
<th>Approaches</th>
<th>Vehicle</th>
<th>Provider</th>
<th>Duration</th>
<th>Direct</th>
<th>Indirect*</th>
<th>Teachers</th>
<th>Outreach</th>
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</thead>
<tbody>
<tr>
<td>Space Grant Awardees</td>
<td>Cooperative Agreement</td>
<td>4 Space Grant Awardees ID, MA, NM WY</td>
<td>1–5 weeks</td>
<td>6,095</td>
<td>65,000</td>
<td>673</td>
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<tr>
<td>Contract Award</td>
<td>Contract</td>
<td>Paragon TEC</td>
<td>2-4 weeks</td>
<td>5,000</td>
<td>TBD</td>
<td>250</td>
<td>TBD</td>
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<tr>
<td>NASA Center Collaborations</td>
<td>Varies</td>
<td>Summer Learning Providers</td>
<td>&gt; 40 contact hours</td>
<td>9,495</td>
<td>6,135</td>
<td>330</td>
<td>35,505</td>
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<tr>
<td>Partnerships Development</td>
<td>SAA/MOU</td>
<td>Federal Agencies, Corporations, Associations, Non-Profits, etc.</td>
<td>Varies</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
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<tr>
<td>National Call to join</td>
<td>Sol Web site</td>
<td>Varies – Families, Academic Organizations, Federal Agencies, Industry, Non-profit</td>
<td>Varies</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
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<tr>
<td>Summer of Innovation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>NASA STEM Celebrations</td>
<td>Similar to Ctr. Open House events</td>
<td>Throughout summer</td>
<td>Typically 1 day</td>
<td></td>
<td></td>
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</table>

* Indirect includes students taught by SoI trained teachers and non-tracked participants

** May be trackable

* Prior to April 14, only the Space Grant component existed
## Structural Elements of Sites’ Implementations (Abt Associates, 2010)

<table>
<thead>
<tr>
<th>Site Name</th>
<th># Student Activities</th>
<th># Educator Activities</th>
<th>Site Locations</th>
<th>Student Activity Duration (days)</th>
<th>Educator Activity Duration (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idaho SG</td>
<td>2</td>
<td>2</td>
<td>12</td>
<td>3-5</td>
<td>2-5</td>
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<tr>
<td>Massachusetts SG</td>
<td>7</td>
<td>4</td>
<td>33</td>
<td>3-25</td>
<td>1-15</td>
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<tr>
<td>New Mexico SG</td>
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<td>1</td>
<td>136</td>
<td>17.5</td>
<td>4</td>
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<td>Wyoming SG</td>
<td>1</td>
<td>1</td>
<td>11</td>
<td>20</td>
<td>4.5</td>
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<tr>
<td>Paragon (Chicago)</td>
<td>Unclear</td>
<td>Unclear</td>
<td>31</td>
<td>4-20</td>
<td>0.4-1.5</td>
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</tbody>
</table>

### Center Partnership Sites

- **Camp KSC**: 1, 0, 3, 5, N/A
- **GEAR UP Expl. I**: 1, 0, 1, 5, N/A
- **Miami-Dade**: 1, 1, 4, 5, 3
- **Galena Park**: 1, 1, 2, 5, 2
- **Chicago Parks**: 3, 0, 3, 17.5-20, N/A
- **Cincinnati GEAR**: 1, 1, 3, 10, 5

N/A: Site did not implement Educator Activities

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*a*Camp KSC offered 8 one-week sessions; three were included in the national evaluation

*b*Chicago Parks implemented many activities; three were included in the evaluation due to time constraints