National Aeronautics and Space Administration

NASA Informal Education: Final Report

A Descriptive Analysis of NASA's Informal Education Portfolio: Preliminary Case Studies

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Executive Summary

The National Aeronautics and Space Administration's (NASA) Informal Education Program provides support to individual learning and informal education communities by facilitating access to NASA staff, research, technology, information, and/or facilities. These communities include but are not limited to amateur astronomy groups, after-school programs, libraries, museums, science centers, planetaria, zoos, aquaria, and community groups. NASA's Informal Education Program also provides professional development opportunities for informal science educators and works to facilitate collaborative partnerships between the informal and formal education communities, both inside and outside the agency. The Informal Education Program goals are to (NASA Informal Education website, 2010):

- Increase interest in and understanding of science, technology, engineering, and mathematics (STEM) disciplines by inspiring and engaging individuals of all ages;
- Establish linkages between informal and formal education; and
- Stimulate parents and others to support children's STEM learning endeavors by becoming informed proponents for high-quality, universally available STEM education.

In addition to its education activities, NASA engages in outreach efforts that fall outside the Office of Education (OE). These efforts provide opportunities for the general public to learn about and participate in activities related to STEM and NASA's mission.

As part of its continuing effort to maximize efficiency by assessing the effectiveness of its efforts, NASA's Office of Education contracted with Abt Associates in July 2009 to evaluate the Informal Education Program. The goals of the evaluation are twofold: (1) to gain insight into its investment in informal education; and (2) to clarify existing distinctions between its informal education and outreach efforts.

The evaluation findings provide descriptive information about all the projects in the NASA's education portfolio affiliated with Outcome 3 (Informal Education) and selected Outcome 2 (Elementary and Secondary Education) that serve the informal education community. Additionally, the evaluation findings provide detailed information about five specific NASA-selected informal education projects, partnerships, or activities, and pay particular attention to their progress toward stated goals, use of NASA resources and materials, reach into their respective communities, development of strategic partnerships, and sustainability. The variety of projects selected allows NASA to document a range of activities in its informal education portfolio, to better understand their implementation and effectiveness, and to ultimately inform future funding decisions.

The evaluation of NASA's Informal Education Program is also assisting NASA in identifying any practical differences between its informal education and outreach efforts, and determining if any existing redundancies can be addressed. Findings from this evaluation effort will inform NASA's Office of Education as it reviews its current organizational structure to determine whether the existing composition should be revised.

Key Findings:

Project Profiles

- Of the 54 NASA OE-funded projects serving the informal education community:
  - 39 are affiliated with Outcome 2 (Elementary and Secondary Education); 15 are affiliated with Outcome 3 (Informal Education);
  - The largest proportion have annual budgets of less than $50,000:
    - less than $50,000 (19 projects)
    - $50,000 to $100,000 (7 projects)
    - over $100,000 to $200,000 (8 projects)
    - over $200,000 to $250,000 (5 projects)
    - over $250,000 to $1M (5 projects)
    - over $1M (9 projects)
  - The largest proportion target students as their primary audience:
    - students (25 projects)
    - educators (15 projects)
    - general public (8 projects)
    - students and educators (6 projects)

Preliminary Case Studies

- Reach into the informal education community and beyond varies by project and is extensive overall.
- Partnerships are important aspects of all projects, but require considerable time and effort to sustain.
- All projects report achieving their goals.
- NASA resources, in addition to funding, are used extensively.
- The issue of sustainability continues to challenge projects.

Survey

- There are not clear distinctions between informal education and outreach activities at NASA—rather than attribute activity characteristics to one type of activity or the other, respondents are more likely to attribute activity characteristics to both types of activities or to neither.

Overarching Themes:

- Projects are staffed by committed and knowledgeable individuals.
- Projects share common objectives.
- NASA's Office of Education makes relatively few demands on projects to document their activities and/or accomplishments.
- The lack of tracking, documenting, and reporting practices appears to be the result of absent or inadequate internal systems and minimal accountability requirements.

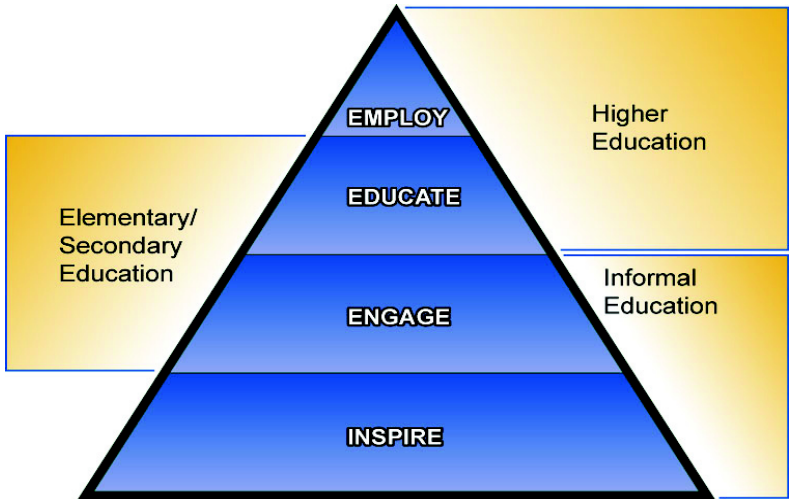
Recommendations Based on the Study Findings:

- Build a reporting system that can accommodate the variety of projects and activities within the Office of Education.
- Develop, implement, and support the reporting protocols and practices required for meaningful use of evaluation data.
- Establish an accountability system to ensure that reporting is consistent, and set in place a clear chain of command for data verification.
- Provide ongoing support for continuing evaluation efforts.
- Enlist relevant stakeholders to establish and contribute to an ongoing practice of indentifying evaluation priorities.
- Clarify the distinctions between informal education and K-12 education, and between informal education and outreach activities.
- Restructure the Office of Education so that ability of programs to function as silos is reduced.

Chapter 1. Introduction

The National Aeronautics and Space Administration (NASA) is dedicated to building a strong science, technology, engineering and mathematics (STEM) workforce, trained to contribute to addressing the challenges of the 21st century. To this end, NASA develops and promotes education and training opportunities for the nation's youth in the hopes of enlisting the best and brightest young scientists and engineers in its ranks. NASA's dedication to engaging youth in STEM is illustrated by its commitment to education. In order to create a skilled scientific and technical workforce, NASA's Office of Education (OE) supports three primary goals: (1) to contribute to the development of the STEM workforce by educating and employing future scientists, (2) to attract and retain students in STEM disciplines by engaging and educating elementary and secondary students, teachers and faculty, and (3) to inspire and engage individuals of all ages in NASA's mission. Projects in NASA's education portfolio are designated to address one of three outcome areas: Higher Education (Outcome 1), Elementary and Secondary Education (Outcome 2), and Informal Education (Outcome 3). The progression of escalating goals associated with each outcome area is depicted by a pyramid, the apex of which is a well-trained and educated STEM workforce (Exhibit 1).

Exhibit 1: NASA's Education Strategic Framework



Source: NASA Education Strategic Coordination Framework: A Portfolio Approach, 2006.

NASA OE recognizes that learners of all ages want to expand their knowledge both inside and outside of formal learning environments. As a result, NASA's Informal Education Program provides support to individual learning and informal education communities by facilitating access to NASA staff, research, technology, information, and/or facilities. These communities include but are not limited to amateur astronomy groups, after-school programs, libraries, museums, science centers, planetaria, zoos, aquaria, and community groups. NASA's Informal Education Program also provides professional development opportunities for informal science educators and works to facilitate collaborative partnerships between the informal and formal education communities, both inside and outside the agency. The Informal Education Program goals are to:

- Increase interest in and understanding of STEM disciplines by inspiring and engaging individuals of all ages;
- Establish linkages between informal and formal education; and

- Stimulate parents and others to support children's STEM learning endeavors by becoming informed proponents for high-quality, universally available STEM education.

In addition to its education activities, NASA engages in outreach efforts that fall outside the Office of Education. These efforts provide opportunities for the general public to learn about and participate in activities related to NASA's mission.

As part of its continuing effort to maximize efficiency by assessing the effectiveness of its efforts, NASA OE contracted with Abt Associates to evaluate its Informal Education Program. The goals of the evaluation are twofold: (1) to gain insight into its investment in informal education; and (2) to clarify existing distinctions between its informal education and outreach efforts.

Roadmap to this Report

This chapter continues with a general introduction, including background and context for informal science education in the literature, how it is evaluated, and NASA's evaluation of its Informal Education Program. In the second chapter, we describe the study design. The third and fourth chapters discuss findings from our data collection efforts, including information about NASA's investment in informal education and distinctions between NASA's informal education and outreach efforts. Lastly, chapter 5 presents our conclusions and recommendations to NASA.

Background and Context of Informal Science Education

A growing body of research suggests the effectiveness of informal learning experiences in inspiring curiosity and engaging interest in STEM fields throughout the life of a learner. Informal science education institutions have a long history of providing enriching experiences for students and the public as well as professional development for educators. The ability of informal education outlets to engage individuals in STEM fields promotes the advancement of a well-trained workforce.

In Tom Bryan's seminal work on education and civic life (1912), he explained that "true education is not a preparation for examination, but a preparation for life." Almost 100 years later, researchers in the field of education still see the importance of learning that takes place outside of the school classroom, or formal educational environments. While we live in a society where an educated workforce is becoming increasingly essential, there is consensus in the literature that formal education alone is not sufficient to educate the American public, especially when it comes to STEM fields.

Bell et al. (2009, p. 28) detail three dimensions across which humans learn: lifelong, life-wide, and life-deep. Lifelong learning represents the need to continue updating one's knowledge throughout the lifecycle, with changing needs over time. Life-wide learning refers to the education that takes place in a variety of scenarios, including but not limited to the formal school environment. Finally, life-deep learning refers to the deeper cultural knowledge needed to participate in society at large. Together, these learning arenas comprise the breadth of environments and formats in which learning occurs. While formal education is a large component of one's learning, particularly during childhood and adolescence, much of our lifelong learning is accomplished through informal education.

STEM education is frequently adapted to informal settings (e.g., zoos, aquariums, science centers and museums). Broadly defined, informal science education is education that exists outside of the formal sphere; however, the literature draws a much more complex picture of what does and does not constitute informal science education. While science centers and afterschool programs are the most commonly cited examples of informal education venues, the definition encompasses a much broader sphere. Most scholars note that informal education is voluntary, learner-motivated and not tied to a particular time frame (Giffin, 1998). The working group on informal education and outreach that was assembled as part of the Academic Competitiveness Council (U.S. Department of Education, 2007) provides a definition that is perhaps the most succinct. According to this group, informal education is defined as education that is:

> voluntary, self-directed, motivated by personal needs and interests, and often socially mediated; it engenders cognitive, affective, and other noncognitive outcomes. … Informal learning experiences are provided by a variety of organizations that offer children and adults learning opportunities outside of formal schooling through exhibits, media, programs, technology, and other means. (p. 20)

Bell et al. (2009) extend this definition of informal science education. They discuss the actions of informal science learners, noting that informal science education involves "developing positive science-related attitudes, emotions, and identities; learning science practices; appreciating the social and historical context of science; and cognition" (pp. 294). They also describe four commitments that informal science practitioners share:

1. engage participants in multiple ways, including physically, emotionally, and cognitively;
2. encourage participants' direct interactions with phenomena of the natural and designed physical world largely in learner-directed ways;
3. provide multifaceted and dynamic portrayals of science; and
4. build on learners' prior knowledge and interests (pp. 297–298)

Diamond (1999) goes beyond these definitions by describing the unique educational benefits that informal education provides. She describes informal learning environments as places where one can learn without the possibility of failure. Unlike in the classroom where there is a designated teacher, participants in informal environments engage in social-reciprocal learning, where everyone acts as both student and teacher. Diamond describes how informal learning most frequently involves learning through play and exploration, which she argues allows participants to gain more thorough knowledge than through rote learning.

Even as some educators struggle to determine if their own discipline falls under the umbrella of informal science education (Falk, Randol, and Dierking, 2008), it is clear that informal science education is crucial to having an American populace that is educated on current science and technology. The United States Department of Education, in its 2007 *Report of the Academic Competitiveness Council*, set national goals of increasing public awareness of STEM concepts through informal education and improving informal educational practice (U.S. Department of Education, 2007).

Informal education is a key part of the education pipeline leading to careers in STEM fields. According to Bell et al. (2009, p. 304), childhood experiences in informal education increase the likelihood that students will pursue science-related occupations as well as seek other science learning

experiences throughout their lifetimes. Informal science experiences also positively influence participants' attitudes toward science and the quality of their science learning in school. Informal education is not required to directly influence learning, but it does make students more likely to learn.

Although the field may still lack a sense of internal coherence, efforts have been made to enhance the legitimacy of the informal science education community. Recently, academic journals, such as *Public Understanding of Science* and *Science Communication*, have been established specifically to address issues related to informal education. *Science Education* added an informal learning section. Perhaps more importantly, informal science education groups are increasingly forming social ties with one another. The Center for Advancement of Informal Science Education (CAISE) was founded by the National Science Foundation in 2007 to help unite informal science practitioners and scholars. CAISE conducts a yearly summit for the STEM informal education community and has created a website (informalscience.org) that serves as a tool for collaboration among informal science researchers (Association of Science-Technology Centers, 2010). Similarly, online communities have become popular and have been shown to be a meaningful form of communication and collaboration within the informal education community (Duncan-Howell, 2010).

Methods Used to Evaluate Informal Science Education

The National Research Council's *Learning Science in Informal Environments: People, Places, and Pursuits* (2009) provides a literature review and summary of research methods used in studies of informal science education programs, dividing them into six strands of informal science learning. Strand 1, Developing Interest in Science, most closely resembles the goals of NASA's Outcome 3 projects to engage and inspire. The description for this strand is "Experience excitement, interest, and motivation to learn about phenomena in the natural and physical world."

The universe of evaluation methods used in informal science education is fairly well defined. And while it is generally agreed that it can be difficult to assess affective outcomes such as interest and engagement (Bell et al., 2009, p. 60), the literature shows that most studies use one or more of a handful of methods, both qualitative and quantitative. The authors go on to identify the research methods used in 26 different studies that assess outcomes related to this strand—interest, engagement, attitudes, beliefs, motivation, and emotional responses. The methods used in these studies include:

- questionnaires or surveys (Likert scale, multiple choice, open-ended)
- interviews (structured and semi-structured)
- observations
- tracking
- focus groups
- discourse analysis
- analysis of facial expressions

Examples of the use of these in the research literature follow.

Due to the subjective nature of affective outcomes (such as interest, attitudes, and engagement), questionnaires, surveys, and interviews are some of the more frequently used methods to collect data. Despite the inherent bias in such self-report data, they remain prevalent in assessing the more emotion-based informal science learning outcomes. For example, Marsha Muckelroy Ricks (2006) used a pre- and post-attitude questionnaire to measure change in student attitudes after attending a

summer science camp. Stevens et al. (2007) used an attitude survey to evaluate students' attitude, motivation, and engagement after attending a two-week science camp. Dierking et al. (2004) used interviews to evaluate a program designed to inspire families to become engaged in science learning. With regard to NASA-funded projects, two evaluations of the How Things Fly exhibition (Anderson et al., 1997; National Air and Space Museum, 2009) used exit interviews and surveys to determine visitors' opinions about and experiences with the gallery, as well as their interest in participating in guided experiments. Similarly, the National Maritime Center used a questionnaire to evaluate visitors' interest in and understanding of Science on a Sphere (SOS) activities, and interviews to provide clarifying information (Nauticus, 2006).

Observations are another fairly common method employed to determine affective outcomes. Watching or listening to a subject's behavior, whether live or on audio or videotape, can provide additional evidence of engagement or interest. In addition to other methods, Dierking et al. (2004) used observations to determine participants' level of interest in and attitudes towards science. Pacific Resources for Education and Learning (2007) used observations at the Bishop Museum to evaluate audience engagement during SOS presentations; and the Science Museum of Minnesota carried out a formative evaluation using observations to examine the amount of time visitors spent at the SOS exhibit and their behavior (Nelson, 2006).

Tracking participation or attendance is another method used as evidence of interest or engagement. Dierking tracked attendance in a STEM informal education program to measure engagement, and the Oregon Museum of Science and Industry (2004) used attendance records for its Boys and Girls Science Club (as well as post-participation survey questions and staff notes) to measure participation and participant satisfaction.

In addition to describing the methods used to gather evidence of outcomes, the literature discusses study designs used for evaluations of informal education programs. The *Framework for Evaluating Impacts of Informal Science Education Projects* (2008) explores a variety of evaluation designs and the importance of considering the nature of a program and the questions to be answered before deciding on a particular approach. For example, a design that requires participants to take a pre- and post-survey would not be practical in a museum setting where the audience is only present for a short time. Comparison studies where individuals are randomly assigned to treatment and control groups can be very difficult to execute well, but they can also afford important opportunities to assess the relative impact of one intervention compared to another or to no intervention at all. As with all research and evaluation methods, while experimental designs may be considered more rigorous, the suitability of the design to the setting and desired outcomes is the most critical consideration.

The Government Accountability Office report, *Program Evaluation: A Variety of Evaluation Methods Can Help Identify Effective Interventions* (2009), explores further the relationship between interventions and suitable evaluation methods. In addition to noting that particular program designs or conditions may not be appropriate for randomized controlled experiments, the authors note the importance of timing when selecting an evaluation approach. Specifically, "randomized experiments are considered appropriate for assessing intervention effectiveness only *after* an intervention has met minimal requirements for an effectiveness evaluation—that the intervention is important, clearly defined, and well-implemented and the evaluation itself is adequately resourced" (p. 20). As one of several alternatives, case studies provide "descriptive information on how an intervention operates and produces outcomes and, thus, may help generate hypotheses about program effects" (p. 28). In the case of the projects selected for NASA's Informal Education Program Evaluation, an

experimental design was not desirable, given the maturity and what was known about the implementation of NASA informal education project activities. Based on the variation in the selected projects' designs and level of maturity, the case study method was chosen for this evaluation.

Evaluation of NASA's Informal Education Program

The importance to federal agencies of having strong evaluation systems in place, and using them to demonstrate effectiveness and inform decision-making, has become increasingly evident. In his October 7, 2009 memo to the heads of federal executive departments and agencies, Peter R. Orszag, director of the Office of Management and Budget, signaled the Obama administration's emphasis on program evaluation. The memo outlined the intended role of program evaluation: 1) to help determine whether government programs are achieving their intended outcomes, 2) to strengthen the design and operation of programs, and 3) to determine how to spend taxpayer dollars effectively and efficiently. The ultimate purpose of federal program evaluation is to invest more in programs that show promise and less in those that do not.

NASA's Office of Education contracted with Abt Associates in July 2009 to evaluate its Informal Education Program to provide insight into NASA's investment in informal education. The evaluation consisted of two components: the first described NASA's investment in informal education, and the second was designed to clarify the distinction between NASA's informal education and outreach efforts.

The evaluation findings provide descriptive information about all the projects in the NASA's education portfolio affiliated with Outcome 3 (Informal Education) and Outcome 2 (Elementary and Secondary Education) that serve the informal education community. Additionally, the evaluation findings provide detailed information about five specific NASA-selected informal education projects, and pay particular attention to their progress toward stated goals, use of NASA resources and materials, reach into their respective communities, development of strategic partnerships, and sustainability. The variety of projects selected allowed NASA to document a range of activities in its informal education portfolio, to better understand their implementation and effectiveness, and to ultimately inform future funding decisions.

The evaluation findings will also assist NASA to determine whether there are practical differences between the informal education and outreach efforts at NASA. The informal education literature does not appear to make a clear distinction between informal education and outreach. Similarly, within NASA, the intent of outreach is defined as, "to raise awareness of, or interest in NASA, its goals, missions and/or programs, and to develop an appreciation for and exposure to science, technology, research and exploration" (as adopted by the Education Coordinating Committee, March 29, 2006). Alternatively, NASA defines informal education as "the process of acquiring new knowledge and skills without the benefit of structured teaching. An educational setting that encourages and facilitates self-directed learning" (NASA Education Strategic Coordination Framework: A Portfolio Approach, February 2006). The NASA definitions of informal education and outreach leave the potential for redundancies.

Alongside this effort to evaluate its investment in informal education, NASA's Office of Education is reviewing its current organizational structure to determine if the existing composition can be improved. The results of the internal survey conducted for this evaluation provide NASA with a clearer understanding of similarities and differences between its informal education and outreach endeavors with which it can make decisions about potential changes to the structure of the Office of Education.

Chapter 2. Evaluation Study Design

The evaluation of NASA's informal education portfolio consisted of two components. The first component was designed to identify and understand NASA's investment in informal education. The second was designed to understand whether there was a distinct difference between informal education and outreach efforts within NASA.

The first component of the evaluation utilized a two-phase approach. In Phase 1 (Fall 2009), the evaluation team reviewed all 87 Outcome 3 (Informal Education) and Outcome 2 (Elementary and Secondary Education) projects in the education portfolio to select appropriate projects for the evaluation. The projects selected for inclusion in the Evaluation were those that served the informal education community. The criteria used for selecting projects were as follows:

- Objective—to engage and inspire
- Location—outside of a formal school location
- Timing—outside of school hours
- Target audience—children and their families and/or informal educators

We created brief criteria-based profiles for each of the 54 NASA projects meeting the selection criteria (see project profiles in Appendix A). In Phase 2 (Winter/Spring 2010), the evaluation team conducted preliminary case studies of five projects/activities, serving the informal education community, that were selected by NASA OE staff. These preliminary case studies provide more detailed descriptions of how select projects/activities are reaching the informal education community and beyond.

The second component of the evaluation responded to OE's desire to understand the practical similarities and differences between the activities offered by Informal Education and Outreach efforts, in an attempt to address any existing redundancies. This information may inform NASA OE as NASA considers reorganization strategies for the Office of Education to more efficiently and effectively meet their desired goals.

Evaluation Questions

The evaluation was designed to address the following questions:

1. What is the evidence that NASA educations projects reach into the informal education community and beyond?
2. Have partnerships helped to increase the impact and sustainability of NASA's informal education projects and, if so, how?
3. Have the projects achieved planned and unplanned outcomes?
4. To what extent are informal institutions utilizing NASA resources and how do they augment the use of materials produced by NASA?
5. What factors are advancing or inhibiting projects' self-sustainability?
6. What are the practical differences between NASA's informal education program and NASA's outreach efforts?

Ultimately, NASA's Office of Education is interested in exploring how they might begin developing plans for an impact evaluation of the Informal Education Program. Findings from this evaluation are intended to be used to make suggestions to OE for next steps.

Describing NASA's Investment in Informal Education

Describing NASA's investment in education began with identifying NASA's informal education projects, activities, and partnerships and creating standardized profiles for them. From this set, NASA selected a subset of projects and the evaluation team created preliminary case studies. The activities undertaken under these two phases are described below.

Phase 1: Profiles of NASA Outcomes 2 and 3 Projects

Phase 1 included the identification of NASA informal education activities and the creation of project profiles for these activities, and the selection of five projects for more detailed preliminary case studies. NASA's OE portfolio manager provided the evaluation team with a spreadsheet listing FY09's OE projects and each project's associated outcome category, cost, funding organization, management organization, project manager, and NASA-generated brief description. From the list of 87 projects categorized as Outcome 2 or 3, 54 projects were identified as serving the informal education community and were included in the initial stage of the evaluation.

Project Profiles

For each of the projects, the evaluation team created a one-page profile that presented the key data points describing the project including its goals, related projects/activities, year established, funding history, products produced, partner institutions, population served, costs and management structure, and key contacts, as well as information on whether it had been evaluated previously and by whom. The profile was first populated using information obtained from secondary sources provided by OE staff including performance reports and evaluations, and related materials available on the NASA website. Additionally, we located documents through Internet searches leveraging the Google, Google Scholar, and Education Resources Information Center (ERIC) search engines. We then shared the profiles with NASA's outcome managers as well as the project managers to confirm the veracity of the information collected and to fill in any remaining gaps in knowledge.

Selection of Projects for Phase 2

NASA's original statement of work for the Informal Education Program Evaluation specified the inclusion of the Visitor Centers and the Competitive Program for Science Museums and Planetariums (CP4SMP) as the projects for the evaluation. However, key OE staff reviewed the profiles and identified five projects for which the evaluation team would produce preliminary case studies during Phase 2; the Visitor Centers were not included. The projects included in the evaluation were selected to represent the work of the mission directorates and the breadth of NASA's investment in informal education. Each of the projects chosen for inclusion is unique in important ways—they include exhibitions, competitive grants, summer and year-round activities, and projects that focus on a variety of populations and STEM fields.

The five projects are as follows:

1. ***How Things Fly (HTF):*** In an effort to expand the awareness of the visiting public about the physics of flight and the development—past, present, and future—of air and space

technologies, NASA is providing in-kind and financial support to the Smithsonian's facelift of the How Things Fly (HTF) exhibition at the Air and Space Museum. The exhibition, the museum's most popular, explains how aircraft and spacecraft fly. This project began in FY 2008 and will continue through 2013, but the content themes of the exhibition will remain unchanged. New interactive devices will be added to augment the concepts already present, and some will replace devices that have proven to be difficult to use or understand. The Resource Center will be redesigned to attract and accommodate a larger percentage of visitors through short, hands-on, staff-led activities. One of the evaluation focuses is on the relationship between HTF and the Washington, DC public schools.

2. ***Astro Camp:*** Astro Camp is a series of weeklong summer camps, one-day Saturday camps, and special events for children ages 7 to 15 that inspire future astronauts and engineers to learn about space and science, technology, engineering, and mathematics. Astro Camp presents math and science principles through fun, hands-on activities, teaching teams of campers to work together to complete missions. Astro Camp sessions inform children about manned space flight, NASA's Constellation Program, the Space Shuttle, and Stennis propulsion testing.

3. ***Science on a Sphere (SOS):*** Science on a Sphere Education Programs: Hurricanes, Cryosphere and Heliophysics Curriculum is a standards-based set of curriculum supplement materials delivered to fifth and eighth grade students during class trips to the Visitor Centers—Goddard, Stennis, Wallops, and Kennedy—and includes prework that must be completed prior to receiving the curriculum. The project has a strong partnership with the National Oceanic and Atmospheric Administration (NOAA), involvement with the Denver Museum Project, and is included in one of the studies awarded to a 2008 Competitive Program for Science Museums and Planetariums (CP4SMP) grantee. The SOS project is center-funded and implemented by the Science Mission Directorate Education and Public Outreach (SMD EPO) staff and Office of Education staff.

4. ***The Competitive Program for Science Museum and Planetariums (CP4SMP):*** CP4SMP is a grant or cooperative agreement opportunity for institutions of informal education. The project supports NASA-themed STEM informal education, including exhibits, within specific Congressionally directed topics: space exploration, aeronautics, space science, earth science or microgravity.

5. ***NASA's partnership with Scouts and related entities:*** NASA's partnerships with the Girl Scouts and Boy Scouts organizations include professional development for troop leaders in earth and space science, activities for youth summer camps, day events, and troop activities. The partnerships also include badge-earning opportunities where scouts interact with NASA scientists and astronauts and engage in hands-on activities, which together introduce them to earth and space science topics and STEM careers. The evaluation reviewed key projects and activities stemming from NASA's relationships with the Girl Scouts and Boy Scouts.

Phase 2: Preliminary Case Studies of Five Informal Education Projects

During Phase 2, the evaluation team developed preliminary case studies of the five selected projects. To develop the case studies, the team both utilized existing information and collected primary data through interviews, surveys, and focus groups. Data collection protocols can be found in Appendix B.

Document Review

The project profiles, developed during the design phase, provided a starting point for the case studies. Additional information was requested from specific project staff for document review, prior to the interviews, to bolster the information already identified. The document review entailed a comprehensive and critical comparison of all available data deepening the team's understanding of the projects, including their successes and challenges, to prepare for the original data collection effort.

Interviews with Project Staff and Partners

Semi-structured telephone interviews were conducted with the projects' staff and partners. Where possible, we talked to stakeholders with different positions and investments in the projects in an attempt to triangulate a common or shared set of perceived successes and challenges, as well as to gain an understanding of how perceptions vary across stakeholders. Discussions with project staff and partners were constructed to be appropriate to the informant's position and understanding of the project. One project, The Competitive Program for Science Museum and Planetariums (CP4SMP), held its annual grantee meeting during the data collection period, affording the evaluation team the opportunity to conduct focus groups and collect surveys from the majority of CP4SMP primary investigators and key grantee staff. Detailed notes were taken during the interviews and focus groups and a summary of survey results was prepared for the analysis.

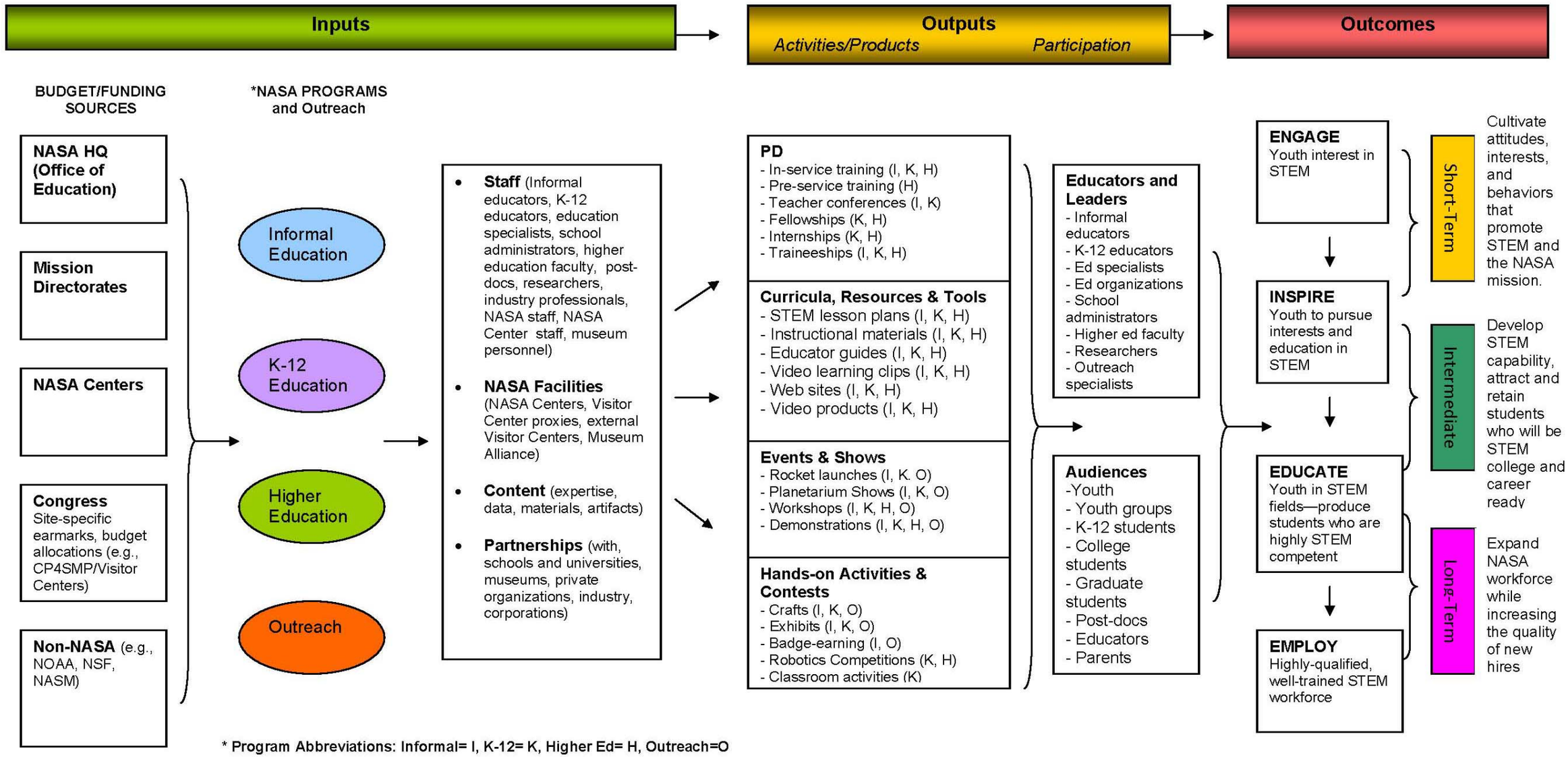
Data Analysis

Interview and focus group notes, as well as the summary of the CP4SMP survey results, were carefully reviewed and preliminary case studies were prepared for each project. The evaluation team met regularly to discuss what had been learned about each project and to identify common themes that crossed all projects.

The Informal Education Program's Role in NASA Office of Education Program

As the evaluation team compiled the project profiles and gathered evidence for the case studies, we developed a better understanding of how the NASA Informal Education Program is situated within the larger context of NASA's Office of Education (OE) portfolio of projects and activities. Through several iterations, a logic model for NASA's OE emerged (see Exhibit 2). Inputs to the model included the funding sources that provided the dollars to the NASA programs and NASA outreach. The programs then provide the requisite project resources (staff, facilities, content, and partnerships) to implement the activities related to professional development, curricula, resources, and tools development, events and shows, and hands-on activities and contests which engage educators, students, and parents. These outputs then lead to the desired outcomes of engagement (in the short-term), inspiration and education (in the intermediate-term), eventually leading to the employment of a highly qualified NASA workforce (in the long-term).

Exhibit 2: NASA Informal Education Evaluation—Informal Education, K-12, Higher Education and Outreach Logic Model (as of May 2010)

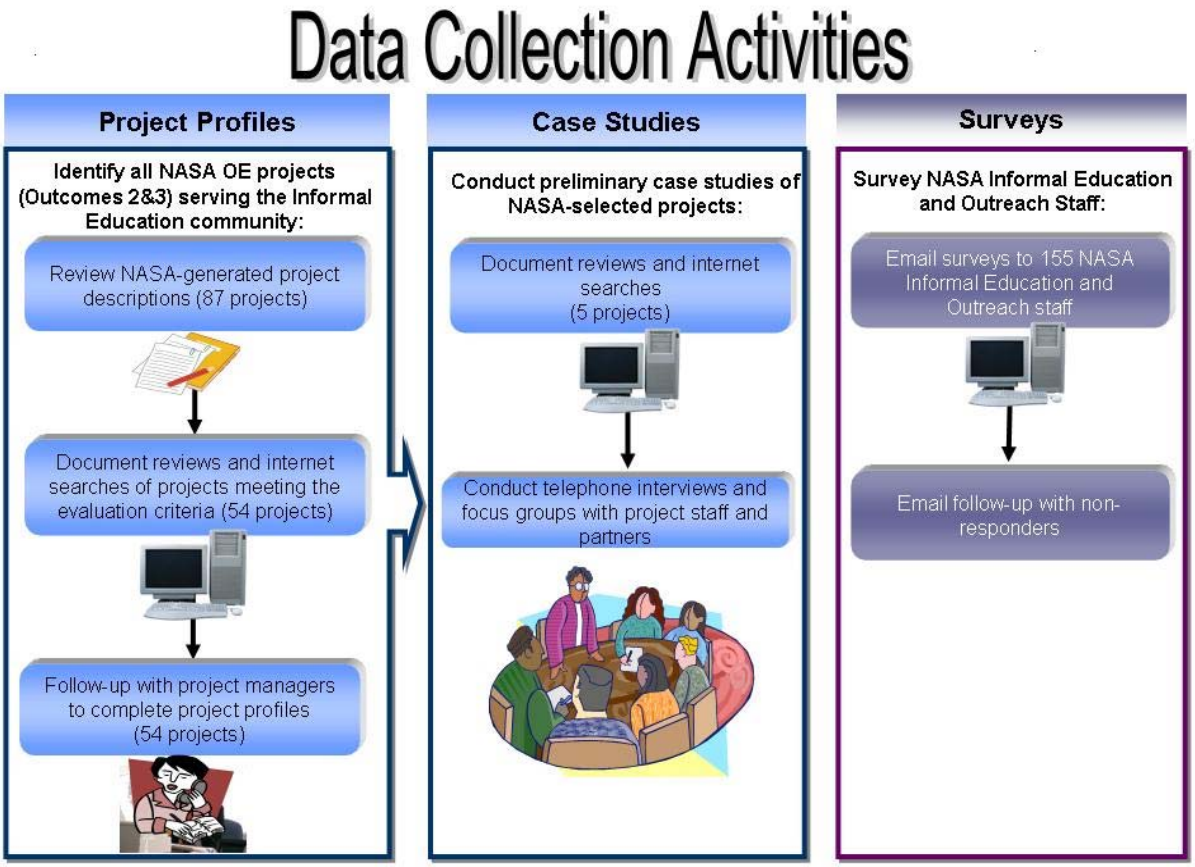


Understanding NASA's Informal Education and Outreach Efforts

To delineate the boundaries of NASA's informal education and outreach efforts, information was gathered from NASA staff involved in informal education or outreatch. Surveys were e-mailed to 155 staff members on one of two NASA listservs, one for outreach points of contact and one for informal education points of contact. Additionally, surveys were distributed at an outreach staff meeting at NASA Headquarters in summer, 2010. Survey recipients were told that completing the survey was voluntary and confidential, and respondents were not required to identify themselves. The survey (see Informal Education/Outreach staff survey in Appendix C) included questions about NASA informal education and NASA outreach. Responses were returned by 77 recipients (response rate=50%).

Exhibit 3 presents the evaluation's data collection efforts involved in each of the evaluation's components.

Exhibit 3: Abt Associates' Data Collection Activities



Limitations

The evaluation of NASA's Informal Education Program was limited by a variety of factors that should be kept in mind when considering the conclusions and their implications.

With regard to the profiles, a major limitation was the reliance on existing data, which varied in its availability and comprehensiveness, as a primary source of descriptive information. Additional information was sought from project leaders, however their availability and willingness to contribute to this effort was another factor that limited the amount and accuracy of the data collected. Finally, the lack of NASA's consistent and comprehensive reporting requirements meant that there was little extant data available that could be used to triangulate data provided through other sources. This was particularly notable with regard to reports of project outcomes and impacts.

As with all voluntary surveys, it must be acknowledged that those who are willing to respond are not always representative of the population as a whole. The response rate for the survey implemented for this evaluation—50 percent—while robust for much of social science research, still raises the question about how the views of those who returned a survey may differ from those who did not.

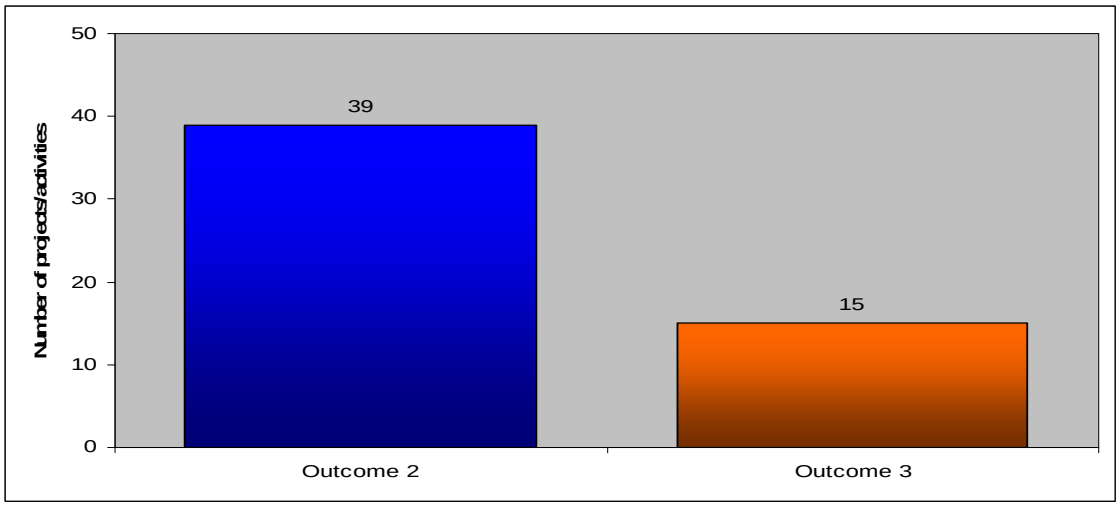
The preliminary case studies presented constraints similar to those associated with the project profiles, as well as some others. First, the small sample of case studies raises questions concerning the degree to which findings can be generalized. As with the profiles, the limited amount of extant data limits the degree to which the outcomes of the projects could be verified. Finally, the method used to identify relevant individuals to interview (project staff suggestions) has limitations of its own, most notably informants' knowledge of who should be included in the sample, as well as individuals' willingness to be interviewed. Last, the lack of specific project-related information, particularly rosters of project staff, made it impossible to know whether all of the relevant project staff had been included in the data collection.

Chapter 3. NASA's Investment in Informal Education

Project Profiles

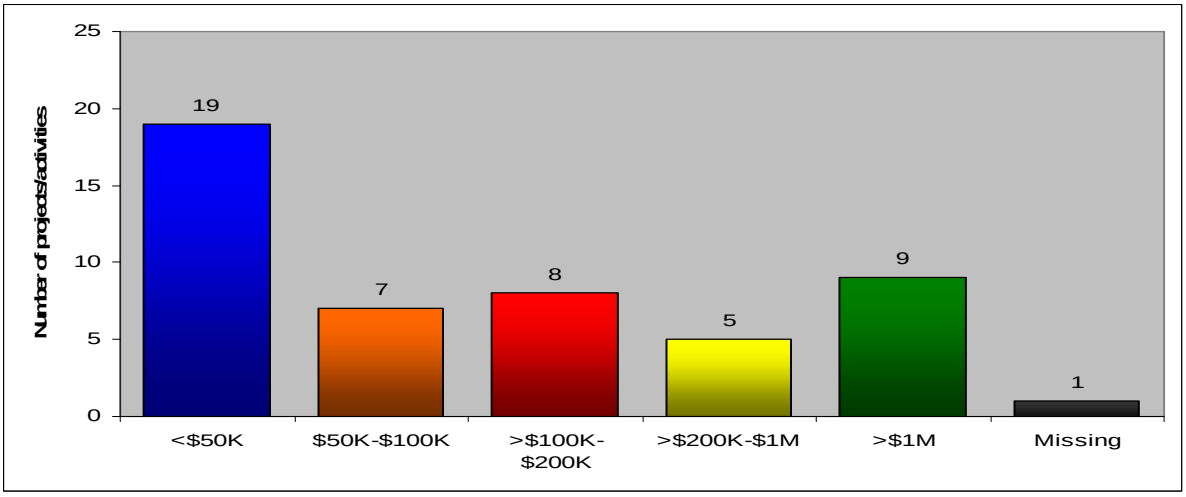
The evaluation team reviewed all Outcome 3 (Informal Education) and Outcome 2 (Elementary and Secondary Education) projects within the education portfolio to identify which projects serve the informal education community. We created project profiles for the 54 projects that met the selection criteria. Exhibit 4 presents the number of projects serving the informal education community, by outcome type. Over two-thirds (39) of projects serving the informal education community were affiliated with the Elementary and Secondary Education Program; the remaining projects (15) were affiliated with the Informal Education Program.

Exhibit 4. Projects Serving the Informal Education Community, by Outcome Type



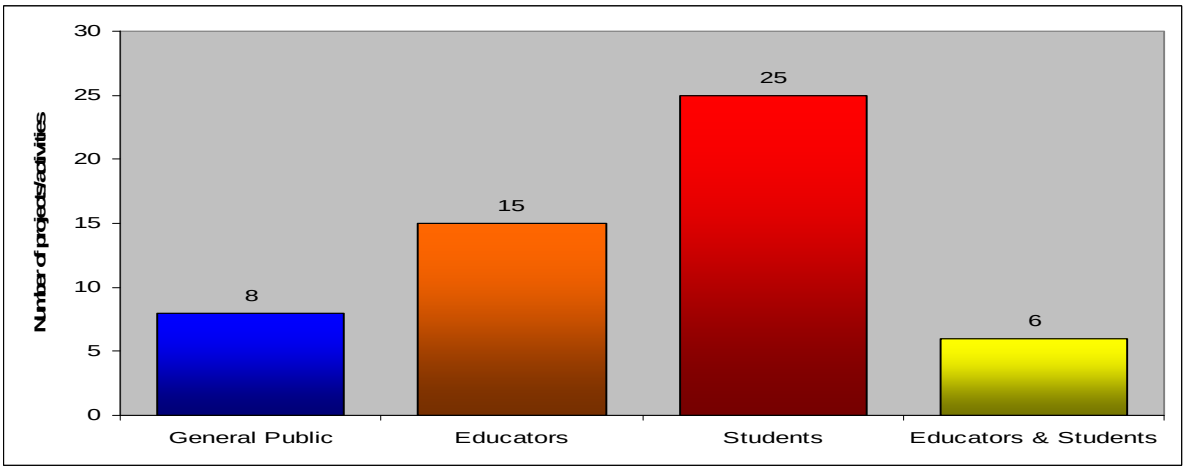
As one component of identifying NASA OE's investment in informal education, the evaluation team grouped projects by annual funding amount, creating annual funding groups of less than $50,000; $50,000 to $100,000; more than $100,000 to $200,000; more than $200,000 to $250,000; more than $250,000 to $1M; and over $1M. Exhibit 5 presents the projects serving the informal education community by annual budget. The greatest number of projects was funded at less than $50,000 annually, with the remaining categories relatively evenly distributed. Nine projects were funded at over $1M.

Exhibit 5. Projects Serving the Informal Education Community, by Annual Budget



Lastly, we reviewed the projects serving the informal education community by target audience (Exhibit 6). The largest number of projects target students (25), followed by educators (15), the general public (8), and both students and educators (6).

Exhibit 6. Projects Serving the Informal Education Community, by Target Audience



Preliminary Case Studies

Case studies for the evaluation of NASA's Informal Education Program are based on document reviews and interviews with project managers, project partners, NASA staff and other individuals who were highly knowledgeable about or integral to the projects. (In the case of the Competitive Program for Science Museums and Planetariums (CP4SMP), we gave grant recipients short questionnaires to fill out and conducted focus groups with the FY2008 and FY2009 grantees at the NASA CP4SMP Conference in March, 2010.) The projects are all at different phases of implementation; some have been in existence for well over a decade while others (e.g., CP4SMP) are considerably less established.

Astro Camp

Since its inception over 15 years ago, Astro Camp, located at Stennis Space Center, has undergone substantial change with regard to its size, programming and educational focus. Today, Astro Camp's largest focus is a summer camp catering mainly to 7–12-year-old children, with more limited programming for 13–15-year-olds. The number of camp sessions has more than doubled since it was founded; there are now 12 five-day sessions over the summer and 8 single-day Saturday sessions—4 in the fall and 4 in the spring. Astro Camp offers a variety of educational programming on topics that include space flight, rocketry, mission to Mars, mission to the moon, solar system, night sky (stars, satellites and planets), and information about being an astronaut. Most of Astro Camp's activities were described by respondents as "arts and crafts" that use disposable products (e.g., egg cartons, glue, construction paper, modeling clay). The camp staff include the Stennis Space Center education director and project manager for Astro Camp, a director, a coordinator, and approximately four assistant directors who are highly qualified (usually master's level) teachers from the surrounding Mississippi/Louisiana area. Additionally, 10–12 local camp counselors, generally college students living in the area over the summer, are hired each year.

Astro Camp's primary goal is to inspire future astronauts and engineers to learn about space and science, technology, engineering, and mathematics (STEM). All Astro Camp activities were designed to meet national STEM standards. Camp staff present math and science principles through hands-on activities, teaching teams of campers to work together to complete missions. The summer and Saturday sessions inform children about manned space flight, NASA's Constellation program, the Space Shuttle, and Stennis propulsion testing.

In addition to serving its campers, Astro Camp is highly sought after to participate in events and celebrations that incorporate demonstrations for or interactions with children. It sets up booths at large NASA-sponsored national events as well as at local events. At these off-site events, Astro Camp staff demonstrate scientific or engineering principles.

Reach into the Community

Astro Camp serves students through its camp sessions, as well as through participation in national and local events. Astro Camp serves approximately 400–500 campers per year during the 12 summer sessions. The vast majority (more than 95%) come from local communities in Mississippi and Louisiana, but there are also campers from a variety of other states including Tennessee, Texas, Alabama, Georgia, New York, Pennsylvania, Florida, Utah, Virginia, Washington, Arkansas, Illinois, Maryland, Michigan, New Jersey, and North Carolina. There are approximately an additional 100 children who attend the fall Saturday sessions and 100 children who attend the spring Saturday sessions.

Astro Camp is also highly engaged in off-site activities that include major, national NASA events to which they are invited by the NASA HQ Strategic Communication and Integration Office, and various local events. Exhibit 7 lists the off-site events in which Astro Camp participated over the past three years. The events vary in size and scope, with potential audiences at these events ranging from under 50 to over one million. At these off-site events, Astro Camp often sets up a booth in which staff demonstrate scientific or engineering principles. Astro Camp staff use everyday materials (e.g.,

clothes hangers) to build rockets propelled by balloons and launch them in their booth. It is a very effective way to demonstrate scientific principles while retaining kids' attention.

Exhibit 7: Astro Camp Off-Site Activities*

Event	Date	Location	Participation
Girl Scout Troop Leaders Weekend	10/2006	MS	45 troop leaders
NASA Christmas Party	12/2006	MS	50 children
Seabee Base Boys and Girls Club Easter Festival	4/2007	MS	2,500
Public Service Recognition Week	5/2007	DC	Not available
KidsFest	6/2007	LA	7,000
STS-118 LAUNCH	8/2007	FL	160
National Black Family Reunion	9/2007	DC	400,000
Boy Scouts—Camp Tiak Parent-Son Weekend	10/2007	MS	300 cub scouts
2007 X-Prize Cup	10/2007	NM	91,000
Seabee Base Boys and Girls Club Easter Festival	3/2008	MS	800
Smithsonian Folklife Festival	6-7/2008	DC	1,022,080
Girl Scouts Extravaganza	10/2008	LA	1,500
Seabee Boys and Girls Club Easter Festival	4/2009	MS	1,000
Zurich Classic	4/2009	LA	3,000
Apollo 40th Anniversary/Final MSSE Planned Test	7/2009	MS	700
Stone Soul Picnic	8/2009	DC	4,000
The Black Family Reunion Celebration	9/2009	DC	3,000
Girl Scout Extravaganza	9/2009	LA	1,500
Intrepid Museum	2/2010	NY	10,000

* Participation numbers are not exact—some counts represent actual interaction with participants while others represent attendance estimates.

Astro Camp staff are reportedly particularly adept at connecting with children in the K–5 age group, largely because the staff are teachers and familiar with this demographic—a demographic that NASA scientists often have difficulty engaging. One respondent noted:

> *The cadence, the way they communicate, their up-tempo and two-person teams masterfully engage young audiences. K-5 is a critical time period to develop STEM interest in kids—during their most formative years—this is where we need to excite, engage and educate kids. By the time they are in higher education, we've already got them. Getting them in earlier is critical.*

In addition to large national NASA events, Astro Camp is involved in local programs and activities. For example, Astro Camp is involved with the Seabee Naval Base, which holds before- and after-school programs and youth/teen recreation activities for children of military and Department of Defense parents. The children involved in the Seabee activities participate in field trips to the Stennis Space Center approximately three or four times per year. While at the Stennis Space Center, the Seabee groups often interact with Astro Camp staff. Having Astro Camp as a resource was described as "truly great" by one Seabee staff member. Astro Camp staff were described as extremely willing to share and provide support whenever Seabee staff call for information about academic content. Seabee also collaborates with the Boys and Girls Club of America, one of its focuses being education and career development. The Seabee program has been ranked the top education and career development program in Mississippi for three years and attributes a lot of its success to its relationship with Astro Camp. Seabee staff are extremely grateful to work with Astro Camp both at the Stennis Center and at local Seabee events. One Seabee staff member commented,

> *They are very responsive, always try to meet our needs, and exceed expectations. They come to our events with so much information and so many resources. I'm always amazed that every kid walks away from the Astro Camp booth with something—we love having them. They always come early and stay late. They are truly team players. It's clear they are there for the children—they are dedicated to children. It's a wonderful experience for the children. Knowledge is their first priority and they know how to make it fun for kids.*

Partnerships

Astro Camp currently has no formal partnerships, although it does engage in periodic informal collaborations. In the past, Astro Camp has worked with:

- The Boys and Girls Club of America, which coordinated a need-based competition for a scholarship to Astro Camp at no charge to the project.
- Mississippi State University (MSU), which had a summer engineering camp and wanted to expand it to southern Mississippi. For two years, Astro Camp collaborated with MSU to run the program for 13–15 year-olds.
- Mississippi Valley State University (MVSU)—Astro Camp went to the Delta to deliver camp activities to kids who otherwise could not afford to attend camp. MVSU provided the site and worked with a local school district to identify criteria for kids to be selected; 35–37 kids from the Delta participated in the camp.

Currently, Astro Camp collaborates with the Girl Scouts of the USA and the Boy Scouts of America. The collaborations have focused primarily on local activities (e.g., Girl Scouts Extravaganza and Troop Leaders Weekend; Boy Scouts Camp Tiak). According to interviewees, the Space Act Agreement between NASA and the Girl Scouts has strengthened Astro Camp's relationship with the Scouts.

Planned and Unplanned Outcomes

Planned Outcomes. NASA-sponsored projects have established goals, specific to each outcome area (Outcome 1, Higher Education; Outcome 2, K–12 Education; Outcome 3, Informal Education). Astro Camp staff reported they are successfully meeting their goal to inspire future astronauts and engineers

to learn about space and STEM. For the past three years, results from surveys of campers have suggested that at least 95% of children who attended Astro Camp reported they learned something new about science. Astro Camp staff also reported they are meeting their NASA goals for Objective 2 and even some for Objective 3. For example, the project's director has been conducting ongoing teacher training (objective 2.2—Educator PD (long duration)), the project has been producing curriculum materials (objective 2.3—Curricular support materials), and K-12 students are directly involved in STEM activities (objective 2.4 – Provide K-12 students with authentic first-hand opportunities to participate in NASA). Astro Camp staff reported that although they have relatively few reporting requirements to NASA's Office of Education, they write annual reports that include statistics relevant to their operation (e.g., geographic location of participants, external activities, and results of camper and parent satisfaction surveys).

Unplanned Outcomes. One of the largest unexpected benefits of Astro Camp is seen in the effects of the camp experience on counselors. The vast majority of camp counselors are college students who are in the local area for the summer months. Astro Camp staff reported that approximately 50% of counselors return for multiple years and they have noted that the experience has resulted in numerous counselors changing majors to education or STEM fields.

Use of NASA Resources

Astro Camp staff reported using numerous NASA resources. Since Astro Camp is located at Stennis Space Center, they have access to one of the four NASA-owned Science on a Sphere exhibits along with all of the accompanying data sets. Additionally, they have access to the Stennis Space Center wellness center pool for their campers along with the Visitor Center buses for camper transportation. Astro Camp staff also report using NASA artifacts—such as space suits, astronaut trays and food—in demonstrations. They also have access to and use NASA Curriculum Guides and Educational Activities (e.g., Rocket Guide).

In addition to the NASA resources used on site at Stennis Space Center, Astro Camp staff also bring NASA materials with them when they participate in local and national events. Their booths at events like the Seabee Naval Base celebrations or the Folk Life Festival are equipped with information booklets, activity books, photographs (e.g., lunar landing, astronaut moon walks, Mars, Hubble Telescope), and hands-on activities. They also hand out NASA souvenirs for participants to take home.

Sustainability

Astro Camp receives $200–250K each year from the Space Operations Mission Directorate (SOMD). Camp staff report they expect to continue receiving the SOMD funds, which are essential to the project's continuation. Astro Camp is currently at capacity and cannot expand further without additional funds. Interest has been expressed within NASA to make camps like Astro Camp available for children throughout the agency but according to interview respondents, there are very few other programs that engage children as well as Astro Camp. Astro Camp staff and NASA's Office of Strategic Communication and Integration expressed interest in finding ways to find additional funding and grow the program; possibly franchising Astro Camp such that it becomes a nationwide endeavor, potentially at all of the NASA Centers. Respondents discussed promoting Astro Camp, to make it more well known, and then pilot testing sites at other Centers with the intent to expand if the results of the pilot tests are positive. Unfortunately, coordinating with the right people to get the

Astro Camp expansion off the ground has been difficult and has moved more slowly than staff members would like. Expanding the scope of Astro Camp is viewed by Stennis and NASA staff as a positive move for NASA, children, and parents, and it represents an opportunity to tie into other communities around the country. NASA is beginning to think about expansion efforts for Astro Camp strategically. The current Administration is prioritizing drawing kids into STEM fields at younger ages. As a result, Astro Camp is eliciting increased attention as a prime opportunity to engage and inspire young children in STEM and the NASA mission.

Competitive Program for Science Museums and Planetariums (CP4SMP)

The Competitive Program for Science Museums and Planetariums (CP4SMP) is a grant or cooperative agreement opportunity, available to institutions of informal education, that supports NASA-themed STEM informal education, including exhibits, within the Congressionally directed topics of space exploration, aeronautics, space science, earth science, and microgravity. Participating organizations include museums, science centers, Challenger Centers and other institutions of informal education. The selected institutions partner with NASA's Museum Alliance, an Internet-based, nationwide network of more than 400 science centers, planetariums, museums, aquariums, zoos, observatory visitor centers, NASA visitor centers, nature centers and park visitor centers. Some projects include partnerships with elementary and secondary schools, colleges and universities.

The goal of the CP4SMP project is to build strategic partnerships and linkages between STEM formal and informal education providers that promote STEM literacy and awareness of NASA's mission through the selected grants. The intended goals of the individual grantees may include but are not limited to:

- Promote lifelong learning in America by students, educators, families, and retirees, using NASA-themed STEM via informal education.
- Encourage, inspire and engage large and diverse audiences via NASA's contributions to everyday life within the Congressional defined technical areas.
- Improve understanding of NASA's missions, contributions to STEM disciplines, and STEM careers, including faculty careers, in pre-K–12 and higher education settings.
- Link and engage providers of informal and formal education to use NASA content through pilot projects that enable educators, parents, retirees, and community leaders to carry the NASA-content back to their households, school, after-school groups, summer camps, 4-H communities, etc.

A total of 32 projects have been selected to receive CP4SMP funds; 13 in 2008, 9 in 2009 and 9 in 2010. A list of recipients of the CP4SMP grants along with grantee-specific information can be found in Appendix D. At the time of the focus groups that served as the basis for this case study, the 2010 cohort had not yet been selected. Therefore, the information presented below is based on responses only from the 2008 and 2009 CP4SMP cohorts. Further, at the time of the CP4SMP focus groups, only the 2008 cohort had begun some degree of implementation, the 2009 cohort had only just received funding and had not yet progressed beyond the planning phase.

Reach into the Community

Based on projected estimates of reach into the grantees' respective communities (defined as the opportunity for community members to observe or interact with grantees' projects), it was estimated that across the 22 projects in the 2008 and 2009 cohorts, approximately 6,106,500 people per year would be reached. Fourteen projects estimated a potential annual audience of 250–100,000; four projects estimated a potential reach of 100,000–500,000 per year, and four projects estimated a potential annual reach of 1 million or more. These estimates were based on visitation data from existing museums, science centers, zoos and planetariums with which grantees were associated and projections for project capacity. Because projects were in the early stages of implementation at the time of data collection, actual numbers were not yet reported. However, all projects reported planning to capture counts of both their direct and indirect reach.

Partnerships

The primary institutions of all CP4SMP projects reported they have formed at least one partnership within their project, and partnerships ranged up to 10 or more. In total, across the grantees, it was estimated that there would be at least 72 external partners involved in the CP4SMP projects. When asked how important partners were to the success of the projects, almost two-thirds reported they were "absolutely essential" to the functioning of their projects.

CP4SMP grantees also discussed some difficulties associated with external partners. As important as partnerships are, they require balance and maintenance; all contributors must get something out of the relationship for it to work. Grantees discussed being mindful of not becoming too dependent on partners, not involving too many partners, the importance of communication with partners (and between partners), and reconciling cultural differences between universities, for-profit organizations, and tribal partners. One specific difficulty grantees discussed was the current state of the economy and the impact it has had on partnerships with school districts. Budget cuts in education affecting both resources and personnel have resulted in the need for grantees to rethink their relationships with schools. Because of these reasons, grantees cautioned that the "more is better" mentality when it comes to partners is not always advisable.

Planned and Unplanned Outcomes

Planned Outcomes. Respondents from both cohorts found it difficult to assess their progress toward their goals, as the FY2009 cohort had just been awarded their grants and had yet to begin implementation of their projects, and many from the FY2008 cohorts still were in the initial planning stages. Only five projects from FY2008 reported they had already achieved some of their goals. Most projects reported they were moving in the right direction—and were on track—but that it was still very early in their grant periods to make any definitive determinations about outcomes.

Unplanned Outcomes. Unplanned outcomes were discussed not in terms of impacts but rather in terms of discovering unanticipated opportunities or obstacles in the course of early stages of program implementation. However, because the majority of grantees were so early in their grant period, it was early yet to report unexpected benefits or barriers. Despite being in early stages of grant implementation, three respondents from the FY2009 cohort reported that the NASA-sponsored CP4SMP conference itself was an unexpected benefit; they expressed that they enjoyed the opportunity to network with staff from the other projects. The FY2008 cohort had more to say about unanticipated events. Eight projects from FY2008 reported better communication with NASA offices

than they expected and participant interest in the project that extended well beyond the intended audiences. There were other unexpected events discussed: one grantee reported some local college/university professors were requiring their students to attend museum lectures and the museum received funds from the institutions as a result. Another grantee mentioned gaining membership to a regional STEM consortium as a result of the CP4SMP grant and through the consortium, obtaining a viable dissemination resource.

Use of NASA Resources

Unanimously, grantees acknowledged that the financial support of the grants was a beneficial resource. There was, however, variation in their perceptions of whether the grants were adequate to complete the work grantees intended. There was variation among the FY2008 projects that had begun implementation; almost all respondents from the FY2009 cohort, which had not yet begun implementation at the time of the survey, reported that the size of their grants was adequate. Among the FY2008 cohort, almost one quarter reported their grant awards were completely adequate, approximately half reported their awards were "just adequate" and over one-quarter reported their budgets were "not quite adequate." Despite this variation in the perceived adequacy of their budgets, all respondents from both cohorts reported that they were confident that they will be able to complete the work in their projects.

Projects from both cohorts reported currently using or expecting to make use of NASA resources beyond the financial support provided by the grant. These resources include NASA scientists as advisors, NASA content, NASA curricula, NASA data, NASA props (e.g., NASA space suits to use during presentations), film clips, visuals (which respondents felt help make content really come alive), and math problem sets. Many grantees noted they are making adaptations, expanding, or augmenting some of the NASA resources they are using. This was most often accomplished by taking existing NASA datasets and adapting them to make them accessible for the projects' intended audiences. Some projects also noted using the NASA logo on their presentations and curricular materials.

Grantees had some suggestions for ways NASA could provide support to grantees in accessing and using NASA resources. A number of grantees reported having difficulty identifying the NASA resources and materials that fit with their project and they were trying to make connections with NASA staff to help identify potentially useful resources with which grantees were not familiar. Grantees also reported that although the NASA website is not easy to navigate, they had the sense there is a lot of material available on the site, and much of it would greatly enhance their work. However, grantees reported having difficulty finding the right materials because of the large amount of content on the website. Others reported they did not know how to get permission to obtain or use NASA materials, nor were they familiar with the steps required to obtain available free materials to distribute to students.

In addition to NASA materials, grantees spoke about their use of NASA staff and expertise. Levels of satisfaction with the interactions with NASA varied across projects. While some grantees reported having highly successful and beneficial relationships with NASA staff (e.g., extremely knowledgeable and helpful project officers, highly beneficial contacts with NASA content experts, and success accessing NASA personnel who could help with administrative grant questions), others reported being frustrated by what they perceived as a bureaucratic structure that was hard to navigate

or a lack of responsiveness by NASA staff when approached. They indicated it is difficult to identify the right person and even once the appropriate person is identified, it is difficult to engage them without a pre-existing relationship.

Given the critical nature of the teenage years in engaging students in science, respondents felt that having access to NASA scientists in creating meaningful opportunities for students was a priority for them. However, finding NASA staff who were regularly available was sometimes a challenge. Once someone with availability was identified, grantees acknowledged that they might have to be actively involved in helping NASA staff interact in ways that were appropriate for the age levels they were serving.

In terms of their relationships with NASA, CP4SMP grantees reported some significant challenges in understanding and adapting to NASA's application, review, approval, and contracting processes. For example, a few grantees reported receiving information or paperwork they did not understand for which they had difficulty accessing assistance. Grantees suggested that NASA:

- Create directions and a checklist for working through the grant paperwork for newly funded cohorts,
- Provide clearer direction about who grantee program officers are and what role the program officer will play, and
- Make available a document that lays out expectations for the grant cycle (e.g., interim reporting requirements) and how the grant might be modified (e.g., how to carry funds over from one year to the next).

Sustainability

CP4SMP grantees articulated they were very grateful that NASA started an agency-wide grant program for informal education that was willing to fund projects in less typical settings (e.g., aquariums). They indicated the grant opportunities are very important as STEM education comes through hands-on learning opportunities and informal education groups are in some ways better prepared to offer hands-on learning. Sustaining the programs funded by the CP4SMP grant was a primary goal for grantees because informal education venues are so critical to STEM education.

All projects, from both cohorts, reported they expect aspects of their project to continue beyond the duration of the CP4SMP grant, which suggests that all CP4SMP projects expect to be at least partly self-sustaining. For many projects, this sustainability is the result of the CP4SMP funds supporting the building of permanent exhibits at the institutions receiving the grants. However, many projects anticipate receiving additional funds or resources beyond those provided by the CP4SMP grants to expand and continue their projects.

Almost 80%of FY2008 projects reported they have already secured additional support while a little less than half of FY2009 projects had secured additional funds at the time of data collection. It should be noted, however, that the FY2009 projects had just received funding at the time of the focus group and many noted they expected to receive additional funding.

While this additional support will most frequently take the form of supplementary grants, projects reported a variety of in-kind support they will receive. The in-kind support includes free space for the

program to operate, materials and datasets, and staff expertise from project partners. Of the projects that reported having secured additional funding, over half said they will receive at least part of this funding from their host institution, and 80% of projects with additional funding said they expect their projects to continue after the CP4SMP grant period is over.

Respondents felt that some components would be more difficult to sustain than others. In some cases, projects reported that outreach would be most difficult to sustain and would suffer after the NASA funding ends. Other projects reported that they would have difficulty sustaining partnerships after the NASA funding period ends. All projects agreed it would be helpful if NASA offered continuing grants, or options to renew so they could have time to evaluate their projects, improve performance and evaluate again.

Some threats to sustainability that were discussed by the CP4SMP grantees include changing priorities of the host institutions, new scientific discoveries or priorities that might result in existing projects becoming obsolete, and financial difficulties experienced by school districts and corporate partners that may limit their continued support. Overall, however, all projects are committed to finding means by which to sustain at least some components of their projects beyond the life of the NASA grants.

How Things Fly (HTF)

The How Things Fly (HTF) gallery in the National Air and Space Museum (NASM) includes over 50 hands-on devices and computer interactive activities. These are designed to introduce visitors to the four forces of flight, including how they function on earth and in space, and to help visitors understand and appreciate the other exhibits in the NASM. Along with the devices and interactive activities, the HTF gallery also includes the Explainers Program, funded by Cessna Aircraft Co., which involves high school and college students who engage visitors in the exhibit's activities on the gallery floor and in the demonstration area.

The history of the HTF Gallery represented in this preliminary case study is based on documentation provided by NASM and NASA, as well as the recollections of NASM and NASA staff who remain in their respective institutions and were available for interviews. In the case of NASA, most individuals who were involved in its original design have since left the agency, whereas several original NASM staff are still employed at the museum and contributed to this document. When contributors' recollections or perspectives differ, each is presented and attributed to the appropriate institution.

HTF opened in 1996, with equal support from the Boeing Co. and NASA. As the first hands-on gallery in the museum, HTF represented a significant advancement in the design of NASM exhibits. Planning for the gallery involved significant contributions from and partnerships with NASA staff, who worked closely with the museum's design team to develop the exhibits. In addition, the design team explored state of the art hands-on science exhibits in museums across the country and the globe, and expanded their team of advisors to include experts in hands-on exhibits.

The gallery received a "facelift" in 2009, with the incorporation of new and enhanced exhibits on lift, drag, thrust, and structures and materials, as well as new artifacts such as NASA's blended wing body model and a radiamic rocket engine. In addition, new signage, lighting, way-finding wind socks,

graphic panels, carpeting, and display cases were added. The refurbishment was a major investment in the gallery, and was intended to improve the educational and overall experience for visitors.

Reach into the Community

NASM staff reported that the HTF gallery is one of the most visited galleries in the NASM. Approximately one million people come to the gallery annually (more than 10 percent of all NASM visitors), and 90,000–100,000 people attend the gallery's interactive demonstrations every year. Moreover, gallery acquisitions, such as NASA's blended wing body model, generate international attention and publicity, as evidenced by coverage in the news, popular and scientific press, and stories on multiple websites viewed across the globe. Recent evaluations of the gallery found that the exhibits draw almost 70% of their substantial audience from families with school-aged children, and 3% of the surveyed audience was visiting with a school group. This number was relatively low due to the timing of the survey—during the summer—when schools are typically closed. However, a conservative estimate based on this finding would suggest that approximately 21,000–30,000 visitors come to the gallery with an organized school group.

Although the gallery aims to appeal to a wide range of ages, NASM staff explained that the physics concepts explored by the exhibits are typically not taught until the college-level. The exhibit text was written by educators, designers, physicists, and an aeronautical engineer, and intended for a middle school grade level to assist children and adults in interpreting the scientific information more readily in the limited amount of time they have to interact with each exhibit. However, at least 20% of the HTF exhibits purposely appeal to lower-elementary and younger students, and 10% are written for a high school and higher audience.

The Explainer Program, in addition to being an important educational component of the gallery, can also be considered evidence of the gallery's reach into the community. NASM program staff reported that all of the high school and college students in the program come from the District of Columbia, Maryland, and Virginia. Most of them learn the science and the history of aviation on the job, as well as useful work habits that will help them when they enter the adult workforce. NASM considers students in the Explainers Program to be internal customers and a worthy audience for efforts to teach STEM disciplines. Informal, anecdotal evidence provided by NASM gallery staff strongly suggests that the experience of being an Explainer has influenced many students' college and career choices as they realize their capabilities and interest in science and/or education. For example, one Explainer who was with the gallery for six years through a graduate program in engineering noted,

> *When I came, I was afraid to give a book report, and now I can speak in front of hundreds of people. I'm confident about my knowledge of science and how to present myself.*

Partnerships

Descriptions of the nature of the partnership between NASA and NASM are expressed below by staff from both institutions. The Smithsonian considers NASA to be a "perfect partner." The physical proximity of NASA Headquarters to NASM and the natural alignment of the two institutions' missions enhance the gallery's ability to make the most of NASA's resources. Indeed, the relationship with NASA is evident throughout the museum's galleries and exhibits. Moreover, the museum has the internal capacity, in the form of staffing and scientific and education expertise, to enable the

gallery staff to take advantage of NASA's resources. As a consequence, NASA's initial involvement during the development of HTF drew deeply on its scientists and education personnel. Meaningful relationships with individual scientists and engineers have continued as a network of support and expertise available for HTF staff to draw upon, providing, for example, advice and assistance with scientific questions as well as important artifacts to be added to existing or new exhibits. NASA staff recall few interactions with NASM staff regarding the initial agreement.

Partnerships with other institutions are critical to NASM and to the HTF gallery, as well. Boeing and Cessna Aircraft Co. have long been involved in the gallery, providing important artifacts, in-kind support, and on the part of Cessna—funding for the Explainers Program. There are also partnerships between the gallery and the District of Columbia, Maryland, and Virginia high schools and universities, where students are recruited for the Explainers Program. These positions are not advertised, but rather NASM Explainer Program staff seeks students directly through individual contacts at local schools and colleges. The important role that these young educators play in the life and success of the gallery cannot be overstated. Almost 50% of all HTF visitors have contact with them—as reported in the most recent HTF evaluation—as they make the science accessible to visitors of all ages through interactive demonstrations, Pocket Science, NASM's Discovery Stations, and exhibit interpretations. For example, more than 60,000 visitors have had a Pocket Science experience in less than a single year.

Finally, relationships with museums across the U.S., Europe, and Canada continue to be important. NASM staff recalls that many relationships were forged during the gallery's initial development, and have been maintained and expanded. These may not be considered formal partnerships, but their importance to the gallery is significant, and their impacts benefit the gallery while also extending its reach. NASA staff recalls that although many of the relationships between NASM and other museums already existed prior to the opening of HTF, the development of the gallery provided an opportunity for additional NASM staff to interact with and gain new insights into these institutions.

These relationships include gallery and museum staff occasionally working with other museums to reproduce HTF exhibits for them and providing them with exhibit blueprints and personal instructions at no cost. For example, NASM staff visited the Franklin Institute in 1994 to look at the flight exhibits there, and Institute staff came to the HTF gallery before updating their exhibits several years ago. And it was their work with the London Science Museum that convinced the HTF design team of the feasibility of having an airplane in the gallery that children could get inside without posting a guard nearby. This led the way for the Cessna 150 and the Boeing 757 fuselage that now occupy space on the gallery floor, and began an exchange of museum visits that continues to enrich and inform the museums' work.

Planned and Unplanned Outcomes

NASA and NASM share an interest in conducting evaluations to document the impact of the gallery, however NASA requires little of HTF staff with regard to evaluation or reporting. Nevertheless, gallery staff organize an annual presentation for all gallery partners as well as provide annual written reports that document HTF activities and accomplishments. Including the first annual donors' meeting in 1997, ten such reports have been provided to NASA for their review.

NASM's commitment to ongoing investigations has led to many evaluations of the gallery over the years. For example, an early external evaluation of HTF documented its success in engaging visitors and teaching them about the forces of flight. More specifically, one of the goals of the gallery design was to place the basics about the forces of flight around the perimeter of the gallery, so that if visitors explored only the perimeter, they would be exposed to these primary principles; the more sophisticated exhibits dealing with supersonic flight and propulsion were placed in the center of the gallery. The evaluation demonstrated that the layout has been successful. In contrast, early evaluations found for example, that the devices designed to demonstrate the force of drag on an airplane were less engaging and successful. The facelift provided the opportunity to create two new devices for this purpose and subsequent evaluations, including a recent evaluation of the facelift, show that these devices are working, and that overall HTF continues to increase visitors' understanding of the physics of flight.

The gallery has a practice of continuing investigation of the effectiveness of new devices and exhibits. Although formal, external evaluations may not always be implemented, internal monitoring efforts are typical. For example, when a new demonstration was implemented, the gallery manager kept precise records of the types of questions asked by visitors, and what concepts they were and were not able to understand.

HTF was the first hands-on gallery in NASM, and investing in this approach represented an important step for the museum and some level of risk-taking. The success of the gallery has led to an increase in interactive exhibits in other areas of the museum, and NASM has applied lessons learned from HTF to the design and layout of other galleries. For example, the physical placement of exhibits and seating has been replicated such that visitor flow is improved and visitors' engagement with displays has been strengthened. Moreover, the process for developing HTF has been replicated by other galleries in NASM. For example, it is recognized that command of the science content alone is not enough to ensure that the displays will be appealing, accessible, and understood across the age groups of interest, and educators are now included in the planning and development process to ensure that the concepts of new exhibits are accessible to all targeted visitor groups.

Use of NASA Resources

NASA financial support includes two monetary awards. The initial sum of $1.4M was awarded in 1995 in response to NASM's proposal, and provided to NASM in three disbursements over a 36-month period to support the design and development of the gallery. NASM staff report that a portion of these funds were retained to cover the cost of the recent facelift.

NASA provided the signed Memorandum of Agreement for the second agreement to the evaluation team. This agreement, made in 2008, was for a five-year period and a total of $700,000, with annual disbursements of $140,000. NASM staff are hopeful that NASA's support for HTF will continue in some form, and at the same time recognize that the future remains uncertain. In discussions regarding the future beyond the second agreement and facelift versus maintenance of the gallery, a NASA Headquarters staff member noted that NASA's Office of Procurement and General Counsel at Headquarter requires that both the current agreement and any future agreement be consistent with the GAO publication Principles of Federal Appropriations Law Third Edition, Volume II pertaining to interagency agreements and the Federal Acquisition Regulations that limit the duration of such funding to five years.

The Memorandum of Agreement for support of the How Things Fly exhibition begins with this statement about its purpose:

> 1.1) The purpose of this Memorandum of Agreement ("MOA" of Agreement") is to facilitate a collaborative partnership between NASA and the Smithsonian Institution, through its National Air and Space Museum, in order to expand the awareness of the visiting public about the physics of flight and the development—past, present and future—of air and space technologies. Both Parties desire to develop a long-term cooperation for the education of the visitor about the scientific principles and foundations of flight. Building on individual agency strengths and competencies, the collaborative partnership will extend and strengthen the work of the Agencies to ensure excellence in Science, Technology, Engineering and Mathematics (STEM) informal education at both NASM and NASA's Field Centers and NASA's Official Visitor Centers.
>
> 1.2) In order to further the goals of expanding the awareness of the visiting public about the physics of flight and the development of air and space technologies, NASM is planning an immediate gallery facelift of the *How Things Fly* exhibition ("*HTF"* or the "Exhibition"). This facelift is in addition to NASM's long-term maintenance of the Exhibition. NASA wishes to support the facelift and the educational mission of the Exhibition by providing in-kind and financial support to the Exhibition through NASM.

Parties from NASA and NASM have different views regarding the degree to which the Agreement allows NASA's support to be used to fund the HTF facelift as opposed to ongoing maintenance and operation of the gallery. The language of the Agreement, summarized below, specifies first that NASA will:

1. Provide access to materials and artifacts that will enhance the HTF story
2. Work with NASM staff to present accurate information and provide expert assistance for HTF
3. Provide content support for the "What's New" area in the HTF gallery from a variety of NASA sources, including relevant, pre-existing educational materials; and a link from the NASA website to the NASM/HTF website.

Second, the language further specifies that NASM will:

1. Include NASA staff in relevant presentations and programming
2. Collaborate with those entities designated by NASA in the development of educational materials related to HTF
3. Provide a "What's New" area in the exhibition where NASA's latest research updates can be presented; and a link from the NASM/HTF website to the NASA website
4. Ensure that NASA is appropriately recognized, and has access to all printed materials developed for HTF.

Staff from NASM reported using the funds provided through the second agreement to support the maintenance and operation of the gallery and for improvements to the HTF website, upgrades to the

exhibits and equipment, and enhancements to the education programs. NASM states the need for maintenance was a novel requirement introduced by the hands-on gallery and required some getting used to when HTF was first conceived and introduced to the NASM. Now, gallery staff prides themselves on both the quick turnaround of repairs, as well as the multiple devices that demonstrate particular principles so that visitors' experiences are not compromised when one device is taken off the floor for repair.

NASM states HTF's use of NASA resources extends far beyond funding, and includes the relationships among HTF staff and NASA scientists and engineers around the country, and the artifacts that NASA makes available to the HTF gallery. NASA resources also include the NASA website, which is used by NASM educators for information related to aeronautics and aerospace. Material on the website is used to help augment their own content knowledge, and Explainers regularly send NASM visitors to the NASA website for more information on science, aeronautics, and aerospace happenings such as when the International Space Station will fly over their house, or what it is like to live and work in space. The monetary value of these additional resources has not been estimated, but it is clear that the two monetary awards do not represent the total contribution that NASA has made to HTF.

Sustainability

NASM states the success and popularity of HTF, demonstrated by its record of annual visitorship, evaluation reports, and internal enthusiasm and support at all levels of NASM management, suggests that the gallery's sustainability is unquestioned. The recent facelift embedded the gallery even more in the museum's structure, for example, schedules for HTF gallery show times and demonstrations are now prominent at the entrance to the gallery and on the monitors at NASM's Information Desk Evaluation. And evaluation reports confirm the value of the hands-on gallery. An evaluation conducted in 2009, reported that "it received a 70 percent favorable rating (Superior plus Excellent) from visitors in its principal target audience: families with children in a single age grouping."

Yet NASM staff acknowledge that continued support from a variety of sources is necessary for the gallery to be sustained in its current form. Museum staff interviewed for this report could not imagine the museum without the gallery. NASM states current NASA support for HTF is only part of what is required to sustain the gallery. NASM funds the gallery staff who manage, develop programming, and maintain HTF, as well as the institution's staff who sustain the gallery's growth and development through ongoing fundraising, financial oversight, and exhibit planning and installation. The Explainers Program is a large part of what makes HTF successful, demonstrated by the amount and depth of contact Explainers have with the public. The program is funded by Cessna for a 10-year period and Boeing also provides considerable support for HTF in the form of artifacts and expertise. The loss of any one of these supports would pose a significant challenge to the sustainability of HTF. With this in mind, NASM staff view the conclusion of the current five-year agreement, which will occur at the end of FY 2013, as an important point in time when the commitment must be reconsidered.

NASM states additionally, sustaining the gallery implies more than maintaining its current exhibits; the need for improvements and innovations in the gallery is ongoing. Although the physics of flight remains constant, the exhibits must keep pace with rapidly changing technology and innovations in

aeronautics. In addition, other improvements in the gallery are necessary. For example, the gallery's website requires a significant redesign, and a large space within the gallery that was originally intended as a resource center with computers available for public use is to be refitted as a science café, where visitors can engage in their own investigations. These projects require significant and new funding beyond what NASA can provide, and additional fundraising for the gallery is a consistent need.

Science on a Sphere (SOS)

Science on a Sphere (SOS) is a large visualization system that uses computers and video projectors to display animated data onto the outside of a large sphere. SOS is a three-dimensional globe that can show dynamic images of the atmosphere, oceans, and land of a planet. The National Oceanic and Atmospheric Administration (NOAA) primarily uses SOS as an education and outreach tool to describe the environmental processes of Earth. SOS is installed in numerous venues all over the world. Currently, it is installed in four NASA Visitor Centers (Goddard Space Flight Center, Kennedy Space Center, Stennis Space Center, and Wallops Flight Facility) and at the Denver Museum of Nature and Science (DMNS), a CP4SMP grantee site. The audience experience varies greatly at each of the five sites. Some spheres primarily have continuously looping content with no accompanying presentations, while other sites offer many presentations and workshops to a variety of audiences. Each of the NASA SOS sites is in a different phase of implementation. For example, the installation and implementation of the sphere at Kennedy Space Center was recently completed in April 2010 while the sphere at Goddard Space Flight Center has been in place for three years.

Reach into the Community

Science on a Sphere's reach into the community is extremely broad. The NASA Visitor Centers and the Denver Museum of Nature and Science are all open to the general public and display the sphere in such a way that all visitors have the opportunity to observe it easily. The Visitor Centers at Goddard, Wallops, and Stennis each have approximately 37,000 visitors per year, while Kennedy and the Denver Museum each have an annual visitorship of over 1 million. At both Wallops and Stennis, attendance is highest during the summer months—at Wallops, the audience is primarily tourists, one-time visitors. At the Denver Museum, approximately 80% of the audience is return visitors.

The target audience for all SOS sites includes the general public and school groups. Some of the sites also target youth groups such as the Scouts, other NASA project participants such as Astro Campers, and teachers and other education professionals.

NASA-developed products related to the sphere extend across communities. As part of its continuing support, NOAA developed a SOS Collaborative Network of all SOS users to facilitate the sharing of new datasets. Because NASA Goddard creates both datasets and movies for projection onto the sphere, the Network allows NASA's reach to extend to all other SOS locations that use NASA's data on their spheres, both nationally and internationally. In addition, NASA Goddard has developed three education products aimed at middle school students, *Hurricanes*, *Cryosphere*, and *Heliosphere*. These lessons were created to align with content on the Maryland State Assessments and are intended to enhance students' understanding of science concepts. Although created in alignment with the Maryland State Assessments, the SOS education products are available to any teacher and include a

welcome letter, factsheets, pre- and post-visit activities, pre- and post-tests, and other resources for teachers.

Professional development is another avenue through which the spheres increase NASA's reach into the community. Some Visitor Centers use the sphere in workshops for teachers and other local organizations. For example, Wallops Space Flight Center used the sphere to conduct training with the National Park Service and the Chincoteague National Wildlife Refuge. Wallops continues to promote the sphere to other organizations to let them know it is available for use in a variety of education programs. Similarly, staff at Goddard reported they use the sphere as a tool for both formal and informal education; they hold both teacher workshops and informal education workshops. The spheres are also reportedly often highlighted during special local events such as Earth Day celebrations.

Social networking sites are an additional means by which NASA connects to its audiences. Kennedy Space Center Visitor Complex has its own Facebook page which it recently used to announce the opening of its SOS exhibit. Goddard also uses a Facebook page, and Kennedy uses Twitter to reach out to the greater community.

Partnerships

The main partner for SOS is the National Oceanic and Atmospheric Administration (NOAA). NOAA's Office of Education has provided over $3.7 million in funding for sphere exhibits and content development. Each institution that installs SOS signs an MOU with NOAA's Earth Systems Research Laboratory (ESRL), the branch of NOAA that develops the technology and software and maintains the dataset catalog.

NOAA provides all SOS locations with assistance during installation of the spheres, and it provides training on sphere maintenance and operation. Once the spheres are installed, NOAA offers to provide help with technical troubleshooting. NOAA's Office of Education also provides indirect support to SOS institutions through its SOS Users Collaborative Network. The Network was established to share information among all SOS sites about new datasets, technical improvements, use of kiosks, guidelines for creating sphere content, sphere-related lessons for teachers, and evaluation results. The Network also has a newsgroup (email list) and holds workshops for Network members where they can remain in contact and learn about relevant topics (e.g., best practices, evaluations, etc). All the SOS sites reported the Network has been invaluable.

The Denver Museum of Nature and Science has slightly more contact with NOAA than the Visitor Centers because of its proximity to NOAA's Earth ESRL, located in Boulder. At their project's inception DMNS staff visited the sphere at ESRL and talked to the facilitators and personnel who work on the datasets. The Visitor Center at Kennedy also has a separate $20,000 contract with NOAA for further support and technical assistance.

Some of the NASA Visitor Centers have begun outreach efforts to external organizations. For example, a three-year partnership exists between Goddard and the Owens Science Center, part of Prince George's County Public Schools (PGCPS). Goddard makes the sphere available to Owens staff prior to the Visitor Center's hours of operation, allowing them to make sphere presentations to PGCPS students. In this way, Owens is able to provide students and teachers access to resources that

might otherwise not be available while increasing Goddard's reach into the community. Owens staff were very eager to express their gratitude to staff at Goddard who have been enormously supportive in training Owens staff, aiding with dataset selection, and assisting with technical problems. Owens reported that Goddard has been an invaluable resource—both for the use of the sphere for their programs and for access to staff for support and assistance.

Planned and Unplanned Outcomes

According to Visitor Center staff, determining outcomes for SOS is a challenge because although they are required to document the number of visitors, they are not required to specifically keep track of visitors to the exhibit and have no methods by which to evaluate SOS goals. Other than the annual Visitor Center Performance Reports, which are not specific to SOS, there are no reporting requirements. Wallops Space Flight Center has a kiosk on site where visitors can provide feedback about their experience by indicating what they liked and what they did not like and offering comments. However, the kiosk is not specific to the SOS exhibit and is not reliably operational. Staff from two Visitor Centers provided data about overall Center attendance, which showed an increase in the number of visitors since the installation of the sphere at each site. Wallops attendance numbers increased 26 percent, and those at Stennis increased approximately 44 percent. Although there is no evidence to directly link the increase in visitors to the spheres, staff at both centers consider it likely that the spheres contributed to the observed increases.

Although there are no quantifiable data to gauge SOS's impact, the sites felt there was anecdotal data. All staff interviewed consider the sphere a benefit to their institutions. One respondent stated, "I think for our needs the sphere has served us very well, to excite students about remote sensing, to give them a better perspective on the world and how scientists actually use world-wide data to draw inferences and connections..." Staff members are enthusiastic about their spheres and believe they meet NASA's Outcome 3 goals by engaging and inspiring audiences while promoting STEM literacy and awareness. The staff at Owens were able to speak about how exposure to the sphere has aided their efforts to encourage students to think about STEM careers in general, and careers at NASA specifically.

As a CP4SMP recipient, the Denver Museum of Nature and Science has reporting requirements, and it will document its process and products. It will conduct formative evaluations throughout the project. In addition, an external evaluator will carry out a final summative evaluation. However, because the CP4SMP project is still in the early stages of implementation, there are currently no available data from these evaluation activities.

Use of NASA Resources

The Stennis, Kennedy, Wallops and Denver Museum spheres were purchased with NASA Office of Education (OE) funds. The sphere at Goddard was purchased in 2006 with money from its then director's discretionary fund. OE funds also paid for a technical support contract between the Visitor Center at Kennedy and NOAA, a room makeover to house the sphere at Kennedy, and a contract with ODIN, a technology company, to provide the six computers and associated system administration and upgrades for the Stennis sphere. In addition, OE funded the development of Goddard's three education products for use with the sphere, *Hurricanes*, *Cryosphere*, and *Heliosphere*.

Funding for SOS, beyond the initial purchase, often comes from sources other than OE. For example, Goddard has found other support for the content (movies, datasets) it has produced. Because there is no separate funding source to produce content for SOS, Goddard has leveraged funding from other sources to develop datasets and other sphere content. *Footprints* and *Frozen*, movies produced in conjunction with the sphere, were add-ons to an ongoing earth science project, funded out of NASA Headquarters, and these movies, as well as the films *Return to the Moon* and *Largest*, were built using pre-existing data visualizations and datasets.

The Denver Museum of Nature and Science, although early in its installation of SOS, stated that it has a strong relationship with NASA and is receiving technical support in addition to the grant funds for their project.

Sustainability

All sites reported the sphere is a permanent exhibit and they are committed to its sustainability. Because the greatest expense associated with the spheres is the initial purchase, there is relatively little cost to sustain them. However, one interviewee noted that to sustain the SOS project, both the science and education sectors of NASA would need to be committed to its long-term support. At Goddard in particular, Science Mission Directorate (SMD) money funds critical staff who maintain the servers and hardware and who work with scientists to get the newest science data on the sphere and into the network. Without this collaboration, it would be difficult for SOS to be sustained at Goddard.

The spheres are generally one of many exhibits on which docents and Visitor Center staff present. All four of the Visitor Centers and DMNS have staff trained to use the sphere. The training is fairly simple and requires use of computers and Wii controllers. The training is managed internally (one staff member could easily train another), so staff turnover is not considered a threat to sustainability.

NASA's Activities with Scouts

The great majority of NASA's collaborations with the Boy Scouts of America (BSA) and the Girl Scouts of the USA (GSUSA) are occurring at the local level, driven primarily by the enthusiasm of individuals and pre-existing relationships between the scouting organizations and NASA staff. For example, NASA employees who were Girl Scouts themselves or whose sons are Boy Scouts volunteer with their local councils to engage youth in NASA-related, badge-earning activities or share with them their professional experiences at NASA. Some activities target Scout leaders (e.g., provide direct training in NASA-related content areas and activities that can be used with Scouts); others directly engage youth in hands-on STEM activities intended to increase their interest and understanding of science. In addition, NASA hosts websites that provide activities for events and troop meetings. For example, Space Place provides badge-earning activities for Cub Scouts and the Solar System Exploration provides activities for Girl Scouts. In addition, scouting organizations frequently request NASA scientists and astronauts to speak at events.

Most, if not all, NASA Centers are engaged in activities with their local scout councils and troops. See Appendix E for a map identifying the location of the individual councils NASA had reached through its mission directorates and field center projects between 1999 and 2006. There were over 120 planned events with Girl Scouts councils and over 80 with BSA troops documented from January

1, 2009 to December 31, 2010 (see Appendices F and G). However, because these efforts are largely local and not coordinated across the organizations or within NASA, reporting is inconsistent and there is no central repository for tracking NASA's activities with the Scouts. Therefore, these counts may underestimate the extent to which NASA is working with the scouting organizations.

While enthusiasm for scouting appears strong across NASA, and the activities are numerous, several contacts described them as "ad hoc," meaning activities are pursued typically without focus or strategy beyond the given one-time event. Some of the contacts attribute the missing coordination to a lack of leadership and specific funding to support such efforts. It appears that funding often comes from multiple sources including the Mission Directorates, Headquarters, and the Centers. Furthermore, much of the costs involved in these activities are "in-kind" and not necessarily quantified.

While the majority of NASA's activities with Scouts are small-scale and local, there are two key national activities with scouting organizations—Girl Scouts Core Trainer Workshops, which is linked to the current Girls in Space project, and the BSA's National Scout Jamborees (2005 and 2010)—that are described in greater detail below. These collaborations were chosen because their scope exceeds that of the smaller, local activities.

Girl Scouts Core Trainer Workshops and Girls in Space Project

Utilizing a "train the trainer" model, a team formed jointly by Jet Propulsion Lab (JPL) and Johnson Space Center (JSC) provided Girl Scouts trainer volunteers (GS core trainers) professional development to increase their content knowledge of NASA-related earth and space science and of related hands-on activities that councils can use to engage girls in STEM learning. Between 2002 and 2009, seven workshops (three workshops for new trainers and four for the experienced core trainers who had completed an earlier new trainer workshop) were conducted. After the GS core trainers were established, two workshops were held to bring in new GS core trainers to help disseminate NASA space science. These trainings included both Girl Scouts volunteers and GSUSA staff. The four follow-on workshops for core trainers were attended by volunteer and staff GSUSA trainers who had received more than 60 hours of professional development in the Science Mission Directorate (SMD) "Exploring the Solar System" or "Exploring the Universe" workshops; more than half of these volunteers were also teachers.

Each workshop provided over 40 hours of training over the course of one week. They were designed to enable experiential learning. Focusing on a theme, such as solar system science, they provided lessons to expand the GS trainers' content knowledge, engaged them in hands-on activities, and provided the opportunity to interact with NASA scientists and engineers; the trainings held at JPL and JSC also provided the participants with tours of the NASA facilities. Over the course of all the workshops, several trainers received more than 140 hours of NASA training.

Today, some of the original group of trainers are continuing to work with NASA in GSUSA's Girls in Space, a $400,000 two-year grant from SMD's Research Opportunities in Space and Earth Sciences (ROSES). This NASA grant is the first to provide direct funding to GSUSA. Girls in Space is training Girl Scouts trainers, amateur astronomers, older girl scouts, and council staff who will take this knowledge back to their local councils and implement Girl Scouts astronomy clubs. Two of the

original NASA staff for the "train the trainer" workshops will serve as consultants to this project; one NASA staff member who had been involved in the workshops was a co-primary investigator prior to her retirement.

Reach into the Community

The workshops created a network of 35 Girl Scouts core trainers who are located across 29 states, in both rural and urban areas, and at a U.S. military base in Germany. As of February 2009, these Girl Scouts core trainers had reached 56,258 girls and adults through the trainings and workshops they held and the events led by those they had trained. Appendix F is a map of the trainers' reported events engaging girls and adults as of May 2006. The core trainers have continued to develop and run events incorporating NASA content and materials, such as regional adult trainings, science-themed summer camps, and science festivals, continuing to expand the reach of the workshops.

Girls in Space has thus far trained ten council teams (each comprising two older girls, an amateur astronomer, council staff or volunteer) from Minnesota, Missouri, Florida, Connecticut, Georgia, California, New York, South Dakota, and Ohio. Counts of the number of girls and adults these trainers have reached are not yet available as their training and astronomy club events are at various stages of implementation. However, based on past performance of the core trainers, the co-primary investigator of the project estimated that the trainers participating in Girls in Space will impact 100,000 girls and adults in trainings and clubs.

Partnerships

The key partner for NASA in the train the trainer workshops was Girl Scouts USA (GSUSA). In exchange for providing content and instruction, as well as hosting several of the workshops at NASA centers, the Girl Scouts provided the trainers, the "deployment channel" for NASA's content, and access to nearly 3 million girls and 1 million adults who are members of Girl Scouts USA.

NASA's national level collaboration with GSUSA began in 1999, initiated by JPL's Solar System Exploration Education and Public Outreach Forum and JSC's Astromaterials Research and Exploration Science education team (an SMD Education and Public Outreach program). In 2003, NASA/JPL and GSUSA signed an MOU to formalize this work. The partners share mutual goals, specifically to (1) inspire and motivate girls and women to pursue careers in science, technology, engineering, and mathematics, and (2) engage girls and women in shaping and sharing the experience of exploration and discovery while improving science literacy and making science comfortable and fun for the adult trainers, leaders, and volunteers—and, ultimately, the girls. A NASA-wide MOU was developed in 2005, and updated to include the NASA Deputy Administrator's signature in 2006. The MOU may soon be updated again, as preliminary discussions between the partners have been initiated.

Between January 30 and February 3, 2006, a NASA Explorer Institute (NEI)[1] for "Growing the NASA-GSUSA Relationship through Professional Development" was held at JSC, supported by NASA's Office of Education funds. Designed to broaden planning and implementation of programs under the MOU, the Institute brought together 23 participants from five NASA Centers[2] and ten partnering Girl Scout councils to further develop the NASA-GSUSA relationship. The participants discussed the lessons learned from earlier collaborations and ideas regarding a larger strategic plan for the partnerships. They developed goals and action plans for moving forward. This Institute resulted in the initiation of two new Center-council relationships, as well as the formalization of the other previous relationships. However, as reported by one interviewee who attended the Institute, many (if not all) of the plans developed during this Institute have not been implemented, likely the result of a lack of cross-agency leadership and funding to support these efforts.

The partnership has weathered some ups and downs. Financial issues at the GSUSA precipitated a large-scale reorganization, whereby the organization consolidated its councils to reduce their numbers drastically. The restructuring made it difficult for the Girl Scouts to leverage its NASA training. Because these expectations were not met, ESMD decided not to continue funding after its workshop had been implemented. In addition to the organizational changes, expectations for the train the trainer partnership were not initially well established and understood. Resource issues generated significant tension between GSUSA and NASA. However, interviewees reported that these issues were worked through and the workshops' goals were met. In the current project, Girls in Space, the partnership continues to face challenges. Key staff members on the project have left and expectations for partnership roles have reportedly not been met. The current GSUSA lead (not the original primary investigator) reported that NASA guidance has been difficult to obtain.

Planned and Unplanned Outcomes

While it is too soon to tell what outcomes will result from the *Girls in Space* project, key NASA staff members of the Girl Scouts Core Trainer workshops reported that the overall effort accomplished their goals including those of designing and piloting a professional development workshop, raising the interest of the trainers in STEM, increasing the pool of Girl Scout trainers, and supporting the trainers' development into STEM advocates. The participating 35 Girl Scouts trainers returned to their councils and hosted trainings and events showcasing what they learned at NASA.

Several evaluations are available—all using qualitative methods—that describe individual workshops' implementation, development, and perceived outcomes. Core trainers reported that the trainings positively impacted their knowledge, skills, and enthusiasm for science. As one described to an evaluator, "I've always been interested in science, but having the opportunity to spend so much time working with the people from NASA really made it come alive" (Gutbezahl, 2006). Participants reported that the workshops helped overcome some of their "science phobia": "I dreaded coming.

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[1] Beginning in FY04 and FY05, NASA Explorer Institutes (NEI) supported professional development opportunities to extend the NEI relationship to additional NASA Field Centers, expand the NASA content, and establish new relationships with informal education partnerships including local museums, science centers, NASA visitor centers, and STEM professional organizations such as the Society of Women Engineers and the National Association of Rocketry.

[2] Ames Research Center, Glenn Research Center, Johnson Space Center, Kennedy Space Center, and Marshall Space Flight Center.

(I'm not a space person.) But I loved it and loved the group" (Brackett, 2006). After a workshop in 2004, another core trainer commented: "It was inspiring to be at JPL and to have workshops presented by members of the NASA staff. It was amazing to see the JPL facilities and hear the passion in the voices of the people for training (Solar System Exploration, Education and Public Outreach Forum, 2005).

The workshops also produced unintended outcomes. For example, the project inspired several of the participating trainers to change professions or return to school in order to focus on NASA-related STEM content. Several trainers took college-level courses or conducted their own research about the universe as a result of this collaboration (including one choosing to pursue an advanced degree in astronomy). Others who are also classroom educators altered their instruction because of their experiences, as reported by workshop personnel: "I am now teaching using space science as a lens… It's a whole lot more fun for me and the kids."

Use of NASA Resources

Exhibit 8 presents the funding sources for the individual trainer workshops. Funding for core trainer workshops came from four key sources: the NASA SMD Solar System Exploration Education and Public Outreach Forum, NASA Informal Education, ESMD Education, and SMD's ROSES, the annual NASA Research Announcement for NASA's Earth and space science research programs; amounts ranged between $27K to nearly $600K.

NASA resources, including people, content, and facilities, were all crucial to the workshops' success. Four key NASA staff members, two at JPL and two at JSC, worked with an additional 80 plus NASA personnel from across multiple centers (e.g., Goddard, Langley, Marshall) to learn about NASA space science, exploration, and engineering. Some of the NASA staff helped shape pre-existing content and activities into a curriculum for the workshops and implemented them. NASA staff credit the strategic use of resources—including the tours of its labs and interactions with its scientists and engineers—with deeply inspiring the trainers in ways that a PowerPoint slide could not.

Sustainability

Funding was critical for sustaining the project: after completing the workshop for EMSD, no further funding has been obtained and no future workshops are planned. However, some components of the original workshops continue in the Girls in Space project: the tightly knit group of original core trainers is now helping to design and implement the similar Girls in Space training at Goddard.
To date, NASA has made a substantial investment in the GSUSA core trainer workshops. The staff leading the project recommend that future "train the trainer" workshops continue to present the rich NASA content through hands-on activities and invite NASA scientists and engineers to interact with the trainers. These two elements were critical to the project's success, as well as its ability to leverage GSUSA's pre-existing delivery that was ready to take NASA content to the girls. Additionally, they recommend that further NASA-wide strategic planning and collaboration between NASA centers and local Girl Scouts councils be supported, and that a community of practice be built to enable more efficient and systemic efforts.

National Scout Jamboree

NASA participated in the 2005 Nation Scout Jamboree and will participate in the upcoming 2010 Jamboree at Fort A. P. Hill in Virginia. NASA Headquarters and multiple NASA centers— including Glenn, Marshall, Kennedy, JPL, Johnson, Langley, and Goddard—will be involved. At this 10-day encampment, which typically occurs every four years, Boy Scouts, Venture Crews and Exploring Posts (two co-ed scouting programs), as well as junior staff, scouting adults and the general public from all over the country come together to engage in a wide range of activities that are intended to be reflective of the spirit and skills of scouting. This year's Jamboree is a major event for the Boy

Exhibit 8: Funding for GSUSA Trainer Workshops, 2001-2009

Name of Workshop	Date	Funding Source	Project Cost*	Training Location
Exploring the Solar System	April 2001	NASA SMD Solar System Exploration Education and Public Outreach Forum	NA	GSUSA Macy Training Center, NY
Exploring the Universe	November 2003	NASA SMD Solar System Exploration Education and Public Outreach Forum	NA	GSUSA Macy Training Center, NY
GS USA NASA Experiences: A Vision for Girls in Earth and Space Science (core trainer workshop re. earth and solar system science, new trainer workshop re. Exploring the Universe)	October 2004 December 2004	NASA Informal Education (NASA Explorer Institutes)	$200K	Jet Propulsion Laboratory (first workshop) and GS Macy Training Center, NY (second workshop)
Growing the NASA-GSUSA Relationships Through Professional Development (included one day of training)	February 2006	NASA Informal Education (NASA Explorer Institutes)	$150K	Johnson Space Center
Girl Scouts Exploring in the 21st Century: Promise Them the Moon and Mars	July 2007	NASA ESMD Education	$597.1K	Johnson Space Center
Exploring the Solar System in the International Year of Astronomy	August 2009	NASA SMD Solar System Exploration Education and Public Outreach Forum	$27K	Johnson Space Center
Girls in Space	December 2008 – November 2010	NASA SMD ROSES	$400K	Goddard Space Flight Center

Notes:

NA= Not Available.

* Total project costs include all expenses such as curriculum, development, and evaluation. This is not an annual amount.

Scouts; as the organization celebrates its 100th anniversary, it wishes to show the world what scouting is and why it is important. The BSA anticipates 45,000 attendees—including 37,000 Scouts and 8,000 Scout leaders and staff—plus 275,000 visitors over the 10-day period. Activities at the event are wide-ranging, and include: badge-earning workshops that include hands-on activities and discussions of professional careers; a wide variety of sports including swimming, boating and rafting; a recreation of the original Scout camp including an American Indian village on Brownsea Island; daily ceremonies; and the National and Technology Quest exhibits presented by the armed services and other prominent organizations including NASA. The objective is to provide a "meaningful and memorable experience" that "instills lasting values and traditions of Scouting in America."[3]

NASA will provide approximately $80,000 for the project as it did in 2005. These funds cover the costs associated with the design and printing of artwork, design and production of a patch, travel of the attending astronauts, and small giveaway items. No funds are transferred directly to BSA. Significant additional in-kind support, upwards of $525,000, is anticipated in 2010; $500,000 was estimated in 2005. This in-kind funding includes a NASA trailer exhibit, a telescope (including its transportation and insurance), a NASA space suit, an astronaut photo booth, Mars Rover and rocks, and other such unique NASA resources. The funding comes from a variety of sources including Headquarters, the mission directorates, and several Centers.

NASA's participation in the Jamborees dates back to the 1970s when NASA employees volunteered at the event. In the 1990s, NASA acquired space at the "merit badge midway" area of the encampment, where it provided 45-minute career sessions during which scouts completed a merit badge on a NASA-related topic (e.g., astronomy, aviation, engineering, space exploration). NASA greatly expanded its participation in 2005 by bringing exhibits to provide visitors with a science and exploration experience; in 2010, NASA will bring exhibits similar to those it brought in 2005. This year, NASA will be located in the "Technology Quest" area, a vastly updated version of the former Arts and Science area where 20 of the BSA high-profile partners, including National Geographic, LEGO, and FIRST Robotics, will engage scouts in interactive and innovative events.

Reach into the Community

In 2005, NASA interacted with about 1,200 to 1,500 scouts per day, as well as scouting adults and other visitors (including high-profile individuals such as U.S. congressmen), to reach 15,000 individuals overall. A typical interaction with a Jamboree participant lasted 5 to 15 minutes. This year, a similar number of scouts and visitors are expected to attend. In addition, in 2005 a NASA video clip was used in a camp-wide show during which President Bush spoke, sharing NASA's content with the approximately 50,000 people present.

Partnerships/Collaborations

The Jamboree collaboration draws on the long-existing relationship between the BSA and NASA. There is a natural connection between the organizations as a large group of NASA employees were Scouts or are currently involved in scouting; two-thirds of NASA's astronauts were Eagle Scouts and many of NASA's scientists and engineers are adult Scout leaders.

[3] Jamboree Staff Guides 2005 & 2010.

The value of this collaboration is high for both organizations as they share the common goals of engaging and exciting youth in STEM activities and careers. NASA is one of the high-profile partners participating in the Jamboree often cited in the marketing materials (e.g., website, articles in Scouts newsletters) for the event. The BSA expects that the NASA exhibits will help reignite interest in space exploration careers with a generation who seem less engaged than the previous one. NASA will provide the exhibits and the opportunity for scouts to speak with NASA astronauts, scientists and engineers; in return, BSA provides a venue for NASA to meet its strategic objectives for outreach.

Planned and Unplanned Outcomes

NASA does not have reported outcomes from its participation in the 2005 Jamboree and likely will not produce them for 2010's event; as of yet, NASA does not require any reporting regarding the Jamboree as it is an outreach activity. However, the BSA does evaluate the Jamborees' success, typically through surveys administered both during and after the Jamboree.

NASA's project director of the effort reported positive, unexpected outcomes of participation, primarily through the networking opportunities it provided. Relationships initiated at the 2005 Jamboree led to new collaborative activities and benefits for NASA. For example, connections were made with the Coast Guard, which hosts a voyage for the Sea Scouts into the waters around Galveston. During this excursion, the Sea Scouts take photos as they scuba dive along coastal reef, which they now share with NASA to map changes in the reef.

Use of NASA Resources

Key to the Jamboree's success is its use of NASA resources, including exhibits and NASA's staff. In 2010, NASA's area of the Jamboree will showcase NASA's "Journey to Tomorrow" and "Exploration" Trailers (mobile exhibits), a Hubble Spacecraft, a Mars Rover and rocks, Robots on the Road (hands-on robotics activities), distance learning network activities, a space station downlink, and an astronaut space suit photo booth. NASA staff will bring patches and lapel pins to give to the youth as mementos of their visit. Similar NASA resources were used during the 2005 Jamboree. NASA's staff also plays an important part in engaging the youth in the exhibits and in discussions of STEM careers. The project is led by one individual who reaches out to NASA engineers, scientists, astronauts, educators, graphic artists, and public affairs officers to attend the Jamboree where they interact with the Scouts at the exhibits, talk about their careers, and sign autographs. In 2005, 34 NASA staff attended; in 2010, approximately 35 staff will attend.

Sustainability

Very likely, NASA will continue to play a role at the National Jamboree in the years to come, given the passion of NASA employees for the BSA, as well as the BSA's strong interest in providing their members access to NASA's career content. As long as the NASA exhibits successfully provide ways for Scouts to experience and engage in its work and mission, and the value of NASA's presence at the Jamboree is clear to decision makers at both partner organizations, continued participation is expected. Key to generating this value is using the high-quality NASA exhibits, and complementing them with the presence of the NASA scientists who share their passion for their work with the Scouts.

Summary

Reach into the informal education community and beyond varies by project and is extensive overall. Projects extend their reach from approximately 1,000,000 in the case of How Things Fly to the CP4SMP project's involvement of over 6 million individuals. This is accomplished through a variety of efforts, from large events such as the Folk Life Festival, to summer camps, small workshops, experiences at museums, visitor centers, and other STEM-related outlets. Projects employ multiple tools, including social networking, to reach audiences that include educators, students, the general public of all ages, and youth groups.

Partnerships are important aspects of all projects, and require considerable time and effort to sustain. All projects work with at least some partners. SOS has as few as one or two, while CP4SMP grantees include up to 72 partners. Project leaders discussed both the importance of partnerships to achieving their goals, as well as the time and effort required to build and sustain them.

All projects reported achieving their goals. Project leaders reported they were successful in reaching their intended audiences and increasing participants' interest in STEM, knowledge of STEM content and STEM fields, and appreciation for the NASA mission. In addition, leaders also reported unanticipated outcomes including inspiring audiences and even project staff to change college or career paths to teaching or to STEM fields, and to reaching audiences beyond the population or the numbers originally targeted.

NASA resources, in addition to funding, are used extensively. Projects rely on NASA funding, but other NASA resources are critical to their success. For example, the time, experience, and expertise of NASA personnel are highly valued and critical components of many projects. Likewise, NASA artifacts, materials, curricula software, images and datasets are used in a variety of project venues. Finally, several projects rely on NASA facilities such as the Visitor Centers and inflatable planetariums for their activities.

The issue of sustainability continues to challenge projects. NASA funds are critical to sustaining the majority of these projects' activities; and they continue to seek additional support through other grant opportunities, host institutions, industry, or academic institutions. Regardless of NASA's financial support, maintaining a relationship to NASA is important to projects.

Chapter 4. NASA's Distinction between Informal Education and Outreach

NASA devotes resources in the form of staff time and dollars to making its mission accessible to the public through its informal education and outreach activities. By surveying NASA informal education and outreach points of contact, NASA can gain sharper insights into the activities supported by both areas–their similarities, differences, and potential overlap. The results of this internal survey will provide NASA with a clearer understanding about where it may benefit from efficiencies to its informal education and outreach endeavors and inform decisions about potential changes to the structure of the Office of Education.

To explore staff views about the practical differences between informal education and outreach activities, a four-page survey was administered to NASA informal education and outreach staff.

Surveys were e-mailed to a total of 155 staff members on one of two NASA listservs, one for outreach points of contact and one for informal education points of contact. Additionally, surveys were distributed at an outreach staff meeting at NASA Headquarters in summer 2010 (all attendees at the meeting were also on the NASA listservs and also received the survey via email). Survey recipients were told that completing the survey was voluntary and confidential, and respondents were not required to identify themselves.

Findings

Description of the Sample

The survey asked respondents to describe their position at NASA (contractor/IPA, civil servant, funded by: the Office of Education, a Mission Directorate, a Center, or the Office of Communications) and area of expertise (informal education, K-12 education, higher education, exhibits (outreach), Speakers Bureau (outreach), or other), checking all that apply.

Exhibit 9 summarizes the percentage of respondents who identified outreach and/or informal education as their area of expertise. Twenty-two percent of the sample indicated they were involved in both outreach and informal education activities; 38% were involved in outreach activities, but not informal education activities; 25% were involved in informal education, but not outreach; and 16% indicated they were involved in neither outreach nor informal education.

Exhibit 9: Percentage of Respondents Involved in Outreach And Informal Education

Area of Expertise	Percent of Sample
Outreach	38%
Informal Education	25
Both Outreach and Informal Education	22
Neither Outreach nor Informal Education	16

Note: Percents may not equal 100% due to rounding.

To look at area of expertise, individuals were classified into five categories: (1) outreach, including those who identified outreach only, or outreach and informal education and any K-higher education; (2) informal education, including those who identified informal education, or informal education and other (not specified); (3) outreach and informal education; (4) informal education and K-higher education, or K-higher education only; and (5) other.

Exhibit 10 presents the distribution of respondents' organizational position across all respondents, and within each area of expertise. Overall, the vast majority of respondents identified themselves as contractors or civil servants (86%). This is also true for respondents who reported their area of expertise is outreach; almost half (47%) characterized themselves as civil servants and almost half characterized themselves as contractors (44%). The distribution for informal education staff is somewhat different; a little over one-third (36%) described themselves as contractors, almost one-third (29%) characterized themselves as civil servants, and almost one-third (29%) reported being funded by the Office of Education.

Exhibit 10. Percentage of Respondents in Each Position, by Area of Expertise

	Area of Expertise					
NASA Position	All (n=75)	Outreach (n=38)	Informal Ed (n=14)	Outreach + Informal Ed (n=7)	Informal Ed + K-12 /Higher Ed or K-12/Higher Ed Only (n=8)	Other (n=8)
Contractor (n=28)	37%	44%	36%	0%	63%	12%
Civil Servant (n=37)	49	47	29	86	25	88
Funded by Office of Ed (n=6)	8	0	29	14	12	0
Funded by Mission Directorate (n=3)	4	5	7	0	0	0
Funded by Center (n=1)	1	3	0	0	0	0

Percents may not equal 100% due to rounding.

Distinctions Between Informal Education and Outreach Activities at NASA

Three survey questions focused on trying to identify distinctions between informal education and outreach activities at NASA. Respondents were asked *in principle* and *in practice*, if there are clear distinctions between informal education and outreach activities at NASA and if the activities target different audiences. Exhibit 11 summarizes participant responses. Overall, less than one-third (30%) of survey respondents agreed somewhat or strongly that there are clear distinctions between informal education and outreach activities at NASA. Over two-thirds of respondents (69%) disagreed there are distinctions between informal education and outreach activities at NASA or had no opinion (50% disagreed somewhat or strongly, 19% had no opinion).

Exhibit 11. Distinctions between NASA Informal Education and Outreach Activities

Survey Question: Is there a distinction between informal education and outreach activities at NASA?	**Level of Agreement**				
	Disagree Strongly (%)	**Disagree somewhat (%)**	**Neither agree nor disagree (%)**	**Agree somewhat (%)**	**Agree strongly (%)**
in Principle	17%	31%	13%	29%	9%
in Practice	21	40	15	17	7
Are different audiences targeted	17	25	27	21	9
Average	**18**	**32**	**19**	**22**	**8**

Percents may not equal 100% due to rounding.

The survey then probed the qualities that might characterize informal education, outreach or both. Specifically, respondents were asked to indicate whether explicit attributes—the use of social media, the use of standards-based materials, the existence of reporting requirements, and the requirement that leaders have an education background—characterize informal education, outreach activities, or both. Exhibit 12 presents the findings. Overall, instead of designating qualities as *either* informal education *or* outreach, a greater proportion of respondents assigned characteristics to *both* or had no opinion. Forty-eight percent of respondents characterized social media as both informal education and outreach or had no opinion. Of the respondents who clearly ascribe social media to either informal education or outreach, all (52%) agreed that it is a characteristic of outreach. Over three-quarters of respondents (80%) indicated that requiring leaders to have an education background is a characteristic of both informal education and outreach or had no opinion. However, of those respondents who attributed the characteristic of requiring leaders to have an education background to one or the other activity types, all (16%) agreed it is a characteristic of informal education. Similarly, greater percentages of respondents agreed that reporting requirements (25% versus 8%) and use of standards-based materials (35% versus 4%) are more characteristic of informal education than outreach. However, it is important to remember that in most cases, the majority of respondents did not perceive differences between informal education and outreach activities.

Exhibit 12. Practices Attributable to NASA Informal Education and Outreach Activities

Attribute	Designation to Outreach or Informal Education			
	Characteristic of Outreach Only (%)	Characteristic of Informal Education only (%)	Characteristic of Both (%)	No Opinion (%)
Social media	52%	0%	24%	24%
Reporting requirements	8	25	56	11
Use of standards-based materials	4	35	15	47
Education background	0	16	4	80

Percents may not equal 100% due to rounding.

The evaluation team reviewed and summarized respondents' open-ended answers. Respondents acknowledged the "hazy distinction" between informal education and outreach, and reported the two terms are sometimes used interchangeably within NASA. One respondent suggested that NASA should refine its informal education practices, define it properly, and place it on a par with formal education. Respondents listed the following characteristics of ***NASA's Informal Education Program activities***:

- Targets students, educators, museum professionals
- Involves a real learning experience with hands-on activities in STEM
- "The intent is to increase learning, to educate students, educators and the general public on specific science, technology, engineering or math (STEM) content areas, and to expand the nation's future STEM workforce"
- Involves standards-based content, learning objectives, supplemental materials, trained staff and facilitators
- Can include exploration of STEM careers
- Can serve as an extension of formal education if educators incorporate standards
- Is age-appropriate
- Occurs outside the classroom
- Is structured

Similarly, respondents listed the following characteristics of ***outreach:***

- Targets the general public or scientific community
- Demonstrates NASA's relevance
- Demonstrates the relevance of "STEM, but also social issues, exploration, history, politics, current events, community relations/concerns and more"

- "The intent is to raise awareness of, or interest in, NASA, its goals, missions and/or programs, and to develop an appreciation for and exposure to science, technology, research and exploration"
- Tailored to education level of the general public
- Is flexible
- Often occurs at special events
- Can be equivalent to "marketing"

Attributes Specific to Informal Education

We analyzed items that specifically elicited information about informal education attributes. These included items that asked whether activities utilizing curricula, lesson plans, or teaching guides should be considered informal education; if informal education activities target students and educators; if NASA-funded exhibits are a form of informal education; and whether non-school science programs involving exhibits, media and emerging learning technologies are considered informal education. Exhibit 13 summarizes participant responses. Of the seven items asking participants to rate their perceptions about the attributes of informal education, over 50% agreed that informal education activities target students and educators (58%) and include activities involving exhibits (non-school exhibit programs (63%) and NASA-funded exhibits (55%)). Fewer respondents (between one-third and one-half) agreed that informal education activities promote self-directed learning (46%), include non-school programs involving media (44%), and include activities that use curricula, lesson plans and teaching guides (37%). Only 26% of respondents agreed that informal education activities include non-school programs involving emerging learning technologies.

Exhibit 13. Characteristics of Informal Education

	Level of Agreement				
Survey Questions—Informal Education Activities Include:	**Disagree Strongly (%)**	**Disagree somewhat (%)**	**Neither agree nor disagree (%)**	**Agree somewhat (%)**	**Agree strongly (%)**
Non-school programs involving exhibits	9%	7%	21%	44%	19%
Target students and educators	9	13	19	37	21
NASA-funded exhibits	7	8	30	30	25
Promote self-directed learning	7	12	35	29	17
Non-school programs involving media	13	21	21	32	12
Curricula, lesson plans, teaching guides	28	17	19	24	13
Non-school programs involving emerging learning technologies	24	19	31	19	7

Percents may not equal 100% due to rounding.

Summary

Findings from the survey's demographic questions suggest that NASA's informal education and outreach staff tend to have multiple areas of expertise and positions or sources of funding. Although the majority of informal education and outreach staff are contractors and civil servants, there appear to be numerous multiply-designated individuals and a high degree of fragmentation. There is also a difference in the pattern of positions between informal education and outreach staff; outreach staff are almost entirely contractors or civil servants while informal education staff are more evenly split three ways; they are contractors, civil servants, and funded by the Office of Education.

Clear distinctions between NASA's informal education and outreach activities are lacking. Over two-thirds of respondents reported they disagreed that there are differences between informal education and outreach activities. When respondents were asked if specific activity qualities were more characteristic of informal education, outreach, both, or neither, they were more likely to select both or neither. In other words, respondents did not perceive clear differences between informal education and outreach activities. Those cases in which respondents did perceive qualities that characterized one type of activity or the other, reported that social media was more characteristic of outreach activities and reporting requirements, use of standards-based materials, and requiring an education background for leaders of activities were all more characteristic of informal education. However, it is important to keep in mind that for most of these questions, over 50% of respondents did not attribute characteristics to one activity type or the other.

In those questions asking participants' perceptions of informal education attributes, the highest percentage of respondents agreed that informal education activities include exhibits (non-school programs or NASA-funded) and target students and educators. Fewer respondents agreed that informal education activities promote self-directed learning, use curricula, lesson plans, and teaching guides, or involve non-school programs including media. Respondents were least likely to perceive that non-school activities that involve emerging learning technologies are an attribute of informal education activities. This is consistent with the finding that respondents perceived social media to be more characteristic of outreach activities than informal education.

Overall, there is only weak evidence that respondents perceive certain attributes as more characteristic of informal education or outreach activities. However, respondents did not tend to report clear distinctions between the two activity types and were more likely to report that activity characteristics are attributable to both types of activities or that they did not have an opinion either way. This is consistent with the literature in which there do not appear to be clear distinctions between informal education and outreach.

Chapter 5. Conclusions and Recommendations

In this evaluation, we reviewed and created profiles for NASA education projects affiliated with Outcome 3 (Informal Education) and Outcome 2 (Elementary and Secondary Education) to gain perspective about those projects that serve the informal education community. Based on our inclusion criteria, 54 projects were identified as serving the informal education community. From the 54 projects, NASA OE staff selected 5, representing the breadth of the Informal Education portfolio, that were appropriate for evaluative case studies. The preliminary case studies provided insights into the Informal Education Program's reach into the informal education community and beyond, examining projects' partnerships, achievement of goals, use of NASA resources, and future sustainability. Additionally, we designed and administered a survey to NASA staff to determine if the activities carried out by the Informal Education Program are distinguishable from NASA's outreach efforts. Ultimately, the results of this study are intended to help NASA make future funding decisions and assist in restructuring efforts.

In addition to the findings detailed above, that related specifically to the evaluation questions, this evaluation revealed themes and systemic issues that were only detectable when looking across multiple projects. Below we highlight several characteristics that are shared across projects, discuss potential project impacts, and examine a number of important systemic issues that will hinder NASA's ability to conduct rigorous evaluations of these and other informal education projects in the future.

Conclusions

1. ***Projects are staffed by committed and knowledgeable individuals.*** Interviews with project leaders showed them to be passionate about their project's mission to generate a personal and deeply felt enthusiasm for science and recognition of its relevance to our lives, and an appreciation of the power of NASA's accomplishments. Their dedication leads them to devote an abundance of time and energy to running the best programs possible, and to continue to look for ways to improve their project's implementation and effectiveness and/or to extend its reach.
2. ***Projects share common objectives.*** Although the projects are diverse in their design and STEM focus, they share these common goals:
    a. Imparting the importance of science and of the NASA mission
    b. Engaging/inspiring/instilling in young people a passion for STEM fields
    c. Educating participants about a variety of STEM-related content.
3. ***NASA's Office of Education makes relatively few demands on projects to document their activities and/or accomplishments.*** Despite NASA's clear interest in identifying project impacts and the prevailing emphasis on conducting program evaluations, there are relatively few requirements for projects to systematically record and report project activities and/or outcomes; however some projects choose to undertake this task of their own accord. The CP4SMP project's requirement to include an external evaluator and evaluation plan in project proposals suggests that the commitment to evaluation efforts is increasing within NASA's Office of Education.
4. The lack of tracking, documenting, and reporting practices appears to be the result of absent or inadequate internal systems and minimal accountability requirements. There appears to be absent

or minimal infrastructure in place that provides the structures and systems necessary for regular and systematic tracking and reporting related to critical project components such as project expenditures and income, recruitment efforts, participant achievements, and short- and/or long-term impacts. This minimal NASA-required recordkeeping and reporting may be an outgrowth of its meager accountability systems, such that there appears to be no oversight mechanism in place to ensure that whatever reports are required, are submitted on time and are complete and accurate.

Recommendations and Future Directions

The call for improved evaluation practices is strongly conveyed in the American Evaluation Association's (AEA) paper, *An Evaluation Roadmap for a More Effective Government* (2009). In it, the AEA Evaluation Policy Task Force outlines a framework and set of guiding principles for each federal agency to inform the development of its own evaluation program. Moreover, it advocates that evaluation be used to inform a variety of decisions, all of which are particularly relevant to NASA's Informal Education Program. The assumption is that program evaluation will be used to:

- Address questions about current and emerging problems
- Reduce waste and enhance efficiency
- Increase accountability and transparency
- Monitor program performance
- Improve programs and policies in a systematic manner
- Support major decisions about program reform, expansion, or termination
- Assess whether existing programs are still needed or effective
- Identify program implementation and outcome failures
- Inform the development of new programs where needed
- Share information about effective practices across government programs and agencies[4]

Although our discussions with NASA OE personnel suggest that their vision of the role that evaluation would serve is in sync with the purposes outlined by the AEA Roadmap, it is clear this vision is not being implemented in a way that allows for effective practice. Looking across the case studies completed for NASA's Informal Education Program, systemic concerns emerge (described above) and the necessary steps to address them are suggested below. Given the importance placed on using robust evaluation findings to inform programmatic and budgetary decisions, we urge the leaders of NASA's Informal Education Program to consider the following recommendations:

1. ***Build a reporting system that can accommodate the variety of projects and activities within the Office of Education.*** The elevated role of evaluation in OE is already evident in several ways, including, for example, the requirement for CP4SMP proposals to include external evaluations, and the current design and planned implementation of a common project reporting process, the Office of Education Performance Measurement System (OEPM). A data system that can accommodate the variety of projects and activities, and that can be clearly understood and operated by the many individuals who will be required to populate it with the required information must be robust and is, by definition, complex to design and implement effectively.

[4] *An Evaluation Roadmap for a More Effective Government* (2009), p. 2.

Doing so successfully will require commitment at all levels of OE, such that clear chain-of-command, individual responsibility, and accountability measures are established, and the needed resources for building and maintaining such a system are consistently made available.

2. ***Develop, implement, and support the reporting protocols and practices required for meaningful use of evaluation data.*** Developing and implementing effective tracking protocols and practices will require attention to operational details and clear reporting requirements. Such systems must accurately capture relevant project information over time including financial, personnel, activity, participation, and partner data; and must make necessary fine-grained distinctions, such as identifying both dollars and in-kind support from within particular funding streams. These protocols and practices must be consistent and clear, and support must be available to all staff such that their implementation will be effective and sustained. Systematic tracking over time will enable reasonable comparisons across projects and estimations of trends over time.

3. ***Establish an accountability system to ensure that reporting is consistent, and a clear chain of command for data verification.*** Consistent and high quality evaluation data is required if meaningful decisions are to be made based on it. Likewise, high quality data are more likely to be collected if their utility is commonly known. As mutually reinforcing as both principles are, they will not replace the need for accountability and verification practices that are fully understood and implemented. In the absence of these systems, the quantity and quality of data will decline.

4. ***Provide ongoing support for continuing evaluation efforts.*** Building an evaluation culture requires that internal and external evaluation expertise be identified and supported such that appropriate evaluation designs, methods, and instruments will be consistently employed. Similarly, adequate resources to implement and sustain evaluation practices must be made reliably available. Changing organizational culture takes considerable time and maintenance. NASA's initial efforts to develop a well-defined system for evaluation will be considerable but they will not produce enduring change without consistent and reliable support.

5. ***Enlist relevant stakeholders to establish and contribute to an ongoing practice of identifying evaluation priorities.*** The involvement of OE stakeholders will increase the opportunities to accumulate and utilize knowledge. Center Education Directors, Education Program/Project Managers, Education Leads, and other members of the Education Coordinating Committee can contribute valuable perspectives and will similarly benefit from engaging in work related to building OE's ability to collect meaningful evaluation data, and use it to inform critical programmatic and policy decisions.

6. ***Clarify the distinctions between informal education and K-12 education, and between informal education and outreach activities.*** The OE programs and outreach efforts are associated with access to funding opportunities, reporting requirements, and other operational responsibilities and opportunities. In the absence of clear and transparent definitions and distinctions, it will be impossible to provide clear and transparent management and administrative structures.

7. ***Restructure OE such that ability of programs to function as silos is reduced.*** The lack of clarity in the definitions of informal and K-12 education, and in the distinctions between informal education and outreach activities, contributes to the lack of cohesion among programs. However, the structure of OE is such that programs are able to function as independent and discrete entities. Without a real and perceived cohesion across informal education projects, the ability to accumulate knowledge and use that knowledge to inform decisions will always be diminished.

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Appendix A

Project Profiles

Outcome 2 Profiles

Related projects/activities:	None
NASA informal initiative:	Community Outreach Programs in Education (COPE) - Elem/Sec
Category:	Resources/Opportunities for Educators & Students
Location:	Multi-site
Duration:	Multiple durations
Level (Project or Activity):	Project
Description:	Community Outreach Programs in Education Elem-Sec (COPE Elem-Sec) is a response mechanism for the broad range of inquiries and requests for service from students and educators in grades K-12. Through COPE, KSC provides educational materials, educational services, as well as, coordination of local science fair judges and volunteer opportunities. KSC education staff receive inquiries via email, phone, regular mail, and personal contact and provide appropriate responses to the requesters needs. Funding for this effort is contained in KSC's "crosscutting costs" line item.
URL:	http://education.ksc.nasa.gov/programs/COPE.htm
Goals:	Connect NASA KSC with the local community, while introducing participants to the excitement of working in science, technology, engineering and mathematics for NASA
Year established:	2005
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	Educational materials, educational services as well as coordination of local science fair judges and volunteer opportunities. Examples of informal national COPE education programs include: Engineers Week, Space Day, Take Our Children to Work Day, and Sun Earth Day. Local COPE activities include Science Fairs and Career Days as well as support for community efforts such as Boy Scouts, Girl Scouts, Sally Ride Festivals and public engagements centered on KSC's support of specific NASA missions. Currently, COPE is involved in created an exhibit at Wannado City, a local children's play center and a NASA-themed deck of cards for a game called "You've been Sentenced".
Partner institution(s):	FIRST, Brevard County Schools, Governor's Schools (Florida Institute of Technology, Embry Riddle, and Florida State University)
Notes/additional info/data sources:	
People Served	
Target audience:	Students and Educators in Grades K -12
Eligibility criteria:	None
Competitive process or open to general public:	All are open.
# people served per year	Approximately 5,000
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	Center-KSC
Managing organization:	KSC
Annual funding amount (by year):	$0 (FY09) The only money spent by KSC was on labor; other programs (e.g. FIRST Robotics) are funded by NASA's Science Mission Directorate. However, no funds are given to KSC Education Office for labor or procurement to manage FIRST.
Per-participant cost (if available/applicable):	$0
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Post-program surveys for many COPE programs
Evaluation status (In Progress or Complete) :	In progress (yearly)
Evaluator (Internal or External) :	Internal
External evaluator name:	N/A
Notes/additional info/data sources:	
Contact Information	
Contact information:	Lisa Valencia Education Project Specialist Mail Code: XA-D Telephone: (321) 867-4008 E-Mail: lisa.m.valencia@nasa.gov
Notes/additional info/data sources:	
Status	Verified, Complete

Related projects/activities:	None
NASA informal initiative:	High School Aerospace Scholars (HAS)
Category:	Resources/Opportunities for Students
Location:	Mulitsite: JSC & in school (TX)
Duration:	1 year
Level (Project or Activity):	
Description:	The HAS program is a year-long, web-based educational experience affording over 350 high school students the opportunity to interact with engineers and scientists at the NASA Johnson Space Center. The learning experience focuses on six one-week residential camps where selected students are encouraged to study math, science, engineering, or computer science while interacting with mentors, teachers, scientists, and engineers. Students from across the state of Texas are selected to participate by their state legislator through a competitive process. http://www.epo.usra.edu/programs/has/
URL:	http://aerospacescholars.jsc.nasa.gov/HAS/
Goals:	High School Aerospace Scholars is an interactive on-line learning experience, highlighted by a six-day internship where selected students are encouraged to study math, science, engineering, or computer science by interacting with engineers at the NASA Johnson Space Center (JSC).
Year established:	2000
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	Ten web-based lessons
Partner institution(s):	None
Notes/additional info/data sources:	http://www.epo.usra.edu/programs/has/
People Served	
Target audience:	High school juniors
Eligibility criteria:	US citizen, TX resident, high school junior, interest in STEM, commited to one-year relationship with JSC, have internet and email access
Competitive process or open to general public:	Competitive
# people served per year	1400
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	Center-JSC
Managing organization:	JSC
Annual funding amount (by year):	$55,000
Per-participant cost (if available/applicable):	$500
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Online survey at the end of the program
Evaluation status (In Progress or Complete) :	In progress (yearly)
Evaluator (Internal or External) :	Internal
External evaluator name:	N/A
Notes/additional info/data sources:	
Contact Information	
Contact information:	Linda K. Smith
	Jessica Cejka, program manager (jessica.a.cejka@nasa.gov) 281-483-4853
	Katherine Crouse, logistical coordinator (katherine.crouse-1@nasa.gov) 281-483-6220
Notes/additional info/data sources:	
Status	Verified, Incomplete

Related projects/activities:	None
NASA informal initiative:	Kennedy Intern Project (KIP) - Elem-Sec
Category:	Resources/Opportunities for Students
Location:	Kennedy Space Center, Orlando, Florida
Duration:	Summer (June 8 - August 14 in 2009)
Level (Project or Activity):	Project
Description:	KIP Elem-Sec is a career exploration internship project for high school students. The project provides both STEM and non-STEM related applicants an enriching hands-on experience and a flexible method for KSC Directorates to obtain the necessary resources they need. Funding for this effort is contained in KSC's "crosscutting costs" line item. The majority of the KIP interns are college undergraduate or graduate students.
URL:	http://www.nasalaunchingfutures.com/index.html
Goals:	To attract students interested in STEM and other relevant careers to the Kennedy Space Center, inform them about the KSC's mission, and give them valuable work experience related to their academic studies. To recruit potential future employees to the KSC.
Year established:	2007
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	Some students create poster presentations.
Partner institution(s):	None
Notes/additional info/data sources:	http://www.nasa.gov/offices/education/programs/descriptions/Kennedy_Space_Center_Internship_Project.html
People Served	
Target audience:	High school students who live within 50 miles of the Kennedy Space Center
Eligibility criteria:	Be a U.S. citizen, be at least 16 years of age, have a minimum 3.0 GPA on a 4.0 scale, provide official high school transcripts, provide a resume, provide at least one letter of recommendation, pass a background investigation, have transportation to the Kennedy Space Center, live within 50 miles of the Kennedy Space Center
Competitive process or open to general public:	Competitive
# people served per year	8 high school students in summer 2009
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	Center - Kennedy Space Center
Managing organization:	Kennedy Space Center
Annual funding amount (by year):	FY 2009: $0
Per-participant cost (if available/applicable):	$300/week stipend provided to high school interns
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Post-program survey completed by mentors and students
Evaluation status (In Progress or Complete) :	In progress (yearly)
Evaluator (Internal or External) :	Internal
External evaluator name:	Patricia Gillis (internal)
Notes/additional info/data sources:	
Contact Information	
Contact information:	Patricia Gillis, patricia.j.gillis@nasa.gov, (321) 867-2363
Notes/additional info/data sources:	
Status	Verified, Complete

Related projects/activities:	A college level variant is in development, designed to encourage college freshmen and sophomores to go into the air traffic control field by giving them the opportunity to apply their engineering knowledge to engaging air traffic problems.
NASA informal initiative:	Smart Skies
Category:	Resources/Opportunities for Educators & Students
Location:	Multi-site
Duration:	Line Up with Math takes a minimum of five minutes: usually 30 minutes at Museums, duration unclear in afterschool settings.
Level (Project or Activity):	Activity
Description:	Smart Skies is a series of classroom STEM activities for students in grades 5 – 9, an associated series of professional development activities for teachers, and an active informal education outreach program in collaboration with other professional aviation organizations such as the FAA. The purpose of Smart Skies is to motivate and enhance student instruction, understanding and proficiency in standards-based mathematics and science related to distance-rate-time relationships, as well as interest in aviation-related careers by using the daily experiences of air traffic controllers as a teaching and motivation tool. A complete set of instructional materials – introductory videos, student workbooks, teacher guides with answers, the air traffic control simulator, informal education activities, and alignments to the math and science standards – are available free for download from the project web-site at: http://smartskies.nasa.gov NOTE: Greg Condon is managing the project under contract.
URL:	http://smartskies.nasa.gov/
Goals:	The purpose of Smart Skies is to motivate and enhance student instruction, understanding and proficiency in standards-based mathematics and science, related to distance-rate-time relationships by using the daily experiences of air traffic controllers as a model. The goal of the informal component of Smart Skies is to generate interest in careers in STEM disciplines and to have participants spread this enthusiasm into formal education settings.
Year established:	2004
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	Fly By Math (teacher guides, student workbooks, videos, *no informal components*); Line Up with Math (teacher guides, student workbooks, videos and informal education materials)
Partner institution(s):	Federal Aviation Administration (FAA); National Air Traffic Controllers Association (NATC)
Notes/additional info/data sources:	
People Served	
Target audience:	Students, grades 5-9
Eligibility criteria:	N/A
Competitive process or open to general public:	Open
# people served per year	33,889 total participants from Oct 1, 2008- July 1, 2009 (includes formal and informal participants)
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	ARMD
Managing organization:	ARC
Annual funding amount (by year):	2009 - $160,000 (includes formal and informal components)
Per-participant cost (if available/applicable):	N/A
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	National pilot testing for formal components of Fly By Math and Line Up with Math; classroom trial of Line Up with Math
Evaluation status (In Progress or Complete) :	Complete
Evaluator (Internal or External) :	Internal
External evaluator name:	N/A
Notes/additional info/data sources:	PDFs were received from Program Director
Contact Information	
Contact information:	Greg Condon, gregory.condon@nasa.gov
Notes/additional info/data sources:	
Status	Verified, Complete

Related projects/activities:	none
NASA informal initiative:	Summer Opportunities in Aeronautics (SOAR)
Category:	Resources/Opportunities for Students
Location:	Langely Research Center in Hampton, VA
Duration:	Three weeks during the summer
Level (Project or Activity):	Activity
Description:	Summer Opportunities in Aeronautics (SOAR) is an enrichment activity in aeronautics for 52 high school juniors and seniors (one student from each state). Participants are immersed in NASA-related research and real-world problem-solving experiences through interaction with scientists, engineers and technologists. Participants for this three-week program are selected annually on the basis of their competitive evaluation ratings.
URL:	http://www.soaratnasa.org/
Goals:	To contribute to the development of America's STEM workforce of the future and engage students and their families through hands-on, interactive, aeronautics-related educational activities to increase their science and technology literacy.
Year established:	2008
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	N/A
Partner institution(s):	
Notes/additional info/data sources:	http://www.massachusetts.edu/stem/soar_at_nasa_2009.html
People Served	
Target audience:	High school juniors and seniors who are U.S. citizens
Eligibility criteria:	Minimum 3.0 GPA, minimum 16 years of age, junior of senior in high school, U.S. citizen
Competitive process or open to general public:	Competitive
# people served per year	52
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	Mission-ARMD
Managing organization:	Langely Research Center
Annual funding amount (by year):	$330,000 in FY09
Per-participant cost (if available/applicable):	$6,346.15
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Post-program survey; follow-up impact student will occur to see impact on college career
Evaluation status (In Progress or Complete) :	In progress
Evaluator (Internal or External) :	Internal
External evaluator name:	N/A
Notes/additional info/data sources:	
Contact Information	
Contact information:	Roger Hathaway, roger.a.hathaway@nasa.gov, 757-864-3312
	Gregory Selby, SOAR Director,
	Embrolic Selby, Program Coordinator, SOARatNASA@gmail.com, 757-251-6596
Notes/additional info/data sources:	
Status	Verified, Incomplete

Related projects/activities:	None
NASA informal initiative:	Virginia Aerospace Science and Technology Scholars (VASTS)
Category:	Resources/Opportunities for Students
Location:	Hamilton, VA
Duration:	January through June and seven days during the summer
Level (Project or Activity):	Activity
Description:	VASTS is a STEM career exploration project for high school students. The project comprises an interactive, inquiry-based on-line science, technology, engineering and mathematics learning experience, culuminating with a seven-day residential Summer Academ
URL:	www.vasts.spacegrant.org
Goals:	Allow high school students to explore STEM career opportunities.
Year established:	2008
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	VASTS Scholar Summer Academy Handbook; Program website www.vasts.spacegrant.org; Online course; VASTS overview video - NASA produced
Partner institution(s):	Virginia Space Grant Consortium, Thomas Nelson Community College
Notes/additional info/data sources:	Facebook page created for VASTS Alumni and anyone interested in learning more about the program: http://www.facebook.com/search/?q=VASTS&init=quick#/group.php?gid=28714199516&ref=search&sid=4200251.278330073..1
People Served	
Target audience:	Virginia residents in their junior year of high school
Eligibility criteria:	Virginia resident and US citizen; minimum 16 years of age; currently in junior year of high school; minimum 2.7 GPA; has internet access
Competitive process or open to general public:	Competitive
# people served per year	48 (2008); 118 (2009)
Notes/additional info/data sources:	http://www.doe.virginia.gov/info_centers/superintendents_memos/2008/09_sep/inf227.html
Costs & Management	
Funding organization:	Center - Langely Research Center
Managing organization:	Langely Research Center
Annual funding amount (by year):	FY09: $250,000
Per-participant cost (if available/applicable):	N/A
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	External evaluation plan - Pre and Post Assessment for content knowledge;student surveys for program feedback
Evaluation status (In Progress or Complete) :	In progress
Evaluator (Internal or External) :	External
External evaluator name:	Dr. Arthur Johnson, Director of Edumetrics
Notes/additional info/data sources:	
Contact Information	
Contact information:	Paula Klonowski, science coordinator, Office of Middle and High School Instruction, Paula.Klonowski@doe.virginia.gov, 804 - 371-0249
Notes/additional info/data sources:	Amber Agee-DeHart, Program Manager, aageedeh@odu.edu, (757) 766-5210
	Andi Geyer, Education Specialist, ajgeyer@odu.edu, (757) 766-5210
Notes/additional info/data sources:	
Status	Verified, Complete

Related projects/activities:	EFP, Digital Learning Network
NASA informal initiative:	SEMAA - Science Engineering Mathematics and Aerospace Academy
Category:	Resources/Opportunities for Students
Location:	14 sites located throughout 12 states and the District of Columbia. Site locations include community colleges, four-year colleges/universities, Historically Black Colleges and Universities (HBCUs), Hispanic Serving Institutions (HSIs), Tribal Colleges and Universities (TCUs), primary/secondary schools, science centers and museums.
Duration:	N/A
Level (Project or Activity):	Project
Description:	The NASA Science, Engineering, Mathematics and Aerospace Academy (SEMAA) is a K-12 curriculum supplement project designed to increase the participation and retention of historically underserved and underrepresented K-12 youth in the areas of science, technology, engineering, and mathematics (STEM). SEMAA delivers three core components: a set of hands-on, minds-on K-12 STEM curriculum enhancement activities, a state-of-the-art Aerospace Education Laboratory (AEL), and an innovative Family Café. Site locations include community colleges, four-year colleges/universities, Historically Black Colleges and Universities (HBCUs), Hispanic Serving Institutions (HSIs), Tribal Colleges and Universities (TCUs), primary/secondary schools, science centers and museums.
URL:	http://www.nasa.gov/centers/glenn/education/SEMAA_GRC.html
Goals:	Inspire a more diverse student population to pursue careers in stem related fields; Engage students, parents and teachers by incorporating emerging technologies; and to Educate students by utilizing rigorous STEM curriculum enhancement activities that meet national math, science and technology standards and encompass the research and technology of NASA's four Mission Directorates.
Year established:	1993
History (Congressionally Mandated or Discretionary):	Discretionary Program began with Congressional earmark/directive, received from Congressman Stokes until expanded outside of Ohio,when it became a discretionary program.
Products produced:	N/A
Partner institution(s):	University of the District of Columbia, Washington, DC; Miami-Dade County Public Schools, Miami; Albany State University, Albany, GA; Fernbank Science Center, Atlanta, GA; Morgan State University, Baltimore, MD; Wayne State University, Detroit, MI; New Mexico State University, Las Cruces, NM ; York College/CUNY, Queens, NY; Warren County High School, Warrenton, NC; Cuyahoga Community College, Cleveland, OH; Richland County School District One, Columbia, SC; Oglala Lakota College, Kyle, SD; Tennessee State University/SECME Inc., Nashville, TN; Martinsville City Public Schools, Martinsville, VA; SGT, Inc.; Paragon TEC, Inc.
Notes/additional info/data sources:	Per FY08 Budget Request: Students meet during school, after school or on Saturday mornings, and during the summer to engage in hands-on, interactive learning sessions that are specifically designed for each grade level. Sites at Tennessee State University (TSU), New Mexico State University, and the Miami-Dade County Public Schools are collaborating on a Discovery Research K–12 grant from NSF totaling $300,000 (per Education Highlights 2008doc, http://mynasa.nasa.gov/pdf/300965main_2008_Education_Highlights.pdf) Per Performance Report 2008, SEMAA sites are required to develop partnerships annually that will both enhance and sustain STEM project services beyond NASA funding. Education Performance Report 2008 (http://mynasa.nasa.gov/pdf/294775main_2008_ESE_SEMAA.pdf); http://mynasa.nasa.gov/pdf/168652main_NASA_FY08_Budget_Request.pdf; http://www.nasa.gov/pdf/294775main_2008_ESE_SEMAA.pdf
People Served	
Target audience:	K-12 students
Eligibility criteria:	N/A
Competitive process or open to general public:	Open
# people served per year	FY08: served 57,394 students, parents/adult caregivers, teachers and outreach participants; of these, 40,657 were students (18,894 direct students and 21,763 indirect students) FY07: served 64,296 participants
Notes/additional info/data sources:	Education Performance Report 2008 (http://mynasa.nasa.gov/pdf/294775main_2008_ESE_SEMAA.pdf)
Costs & Management	
Funding organization:	HQ - Elementary/Secondary/eEducation
Managing organization:	GRC
Annual funding amount (by year):	FY09 - $2,226,000 FY08 -$2,553,000 FY07 - $3,281,000
Per-participant cost (if available/applicable):	FY2008 result: $2.553M / 57,394 Total Participants = $44.48 per participant FY2007 result: $3.281M / 64,296 Total Participants = $51.03 per participant
Notes/additional info/data sources:	Education Performance Report 2008 (http://mynasa.nasa.gov/pdf/294775main_2008_ESE_SEMAA.pdf)
Evaluation	
Evaluation strategies:	Impact Study (Abt)
Evaluation status (In Progress or Complete) :	In Process (Abt)
Evaluator (Internal or External) :	External (Abt)
External evaluator name:	Internal: NASA Education Evaluation Information System (2006); External: Benson, Penick and Associates (2001 evaluation); External: Abt and EDC (in process)
Notes/additional info/data sources:	http://www.edc.org/projects/evaluation_nasa_projects; http://www.abtassociates.com/Page.cfm?PageID=12605&OWID=2109768978&CSB=1; http://www.semaa.net/FileUploads/AnnualReport/AnnualReport_20070501.pdf; http://books.google.com/books?id=bGXNOYJaAYoC&pg=PA74&lpg=PA74&dq=SEMAA+evaluation&source=bl&ots=qDa1QTBNdF&sig=BcK--9P0WmSa36kHmZlsdy4IUNM&hl=en&ei=nbyfSu7IKtCc8QaSvNHsDw&sa=X&oi=book_result&ct=result&resnum=8#v=onepage&q=SEMAA%20evaluation&f=false; http://books.nap.edu/openbook.php?record_id=12081&page=111
Contact Information	
Contact information:	Darlene Walker, darlene.s.walker@nasa.gov
Notes/additional info/data sources:	
Status	Unverified, Complete

Related projects/activities:	INSPIRE; replaced SHARP
NASA informal initiative:	SpaceSHIP - JPL Summer High School Internship Program
Category:	Resources/Opportunities for Students
Location:	JPL--Pasadena, CA
Duration:	Eight-week summer program
Level (Project or Activity):	Project
Program/Outcome:	Elementary/Secondary/eEducation (Outcome 2)
Description:	SpaceSHIP is a internship opportunity for minority and underserved high school students interested in STEM disciplines and who live within a 50-mile radius from JPL. One goal of SpaceSHIP is to identify exceptional talent early and use other internship opportunities to bring the students back to JPL during successive summers. Another goal is to increase the diversity of the pool of candidates with potential for future employment by JPL and NASA. Students are placed with JPL scientists and engineers to conduct eight-week research projects.
URL:	http://jplspaceship.jpl.nasa.gov/
Goals:	One goal of SpaceSHIP is to identify exceptional talent early and use other internship opportunities to bring the students back to JPL during successive summers. Another goal is to increase the diversity of the pool of candidates with potential for future employment by JPL and NASA.
Year established:	2006
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	None, unless consider employees a "product" - several of the students return to JPL for several summers (i.e., produces employees) and one who has finished college works there full-time
Partner institution(s):	Dryden Flight Center
Notes/additional info/data sources:	
People Served	
Target audience:	Minority and underserved high school students interested in STEM disciplines
Eligibility criteria:	High school students, 16 or older, US citizen, application & letters of recommendation, home address 50 miles from JPL, 3.0 GPA, evidence/aptitude in STEM
Competitive process or open to general public:	Competitive
# people served per year	FY09: 15
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	Center-JPL
Managing organization:	JPL
Annual funding amount (by year):	FY09 $40,000
Per-participant cost (if available/applicable):	$3,000 per student (for stipend)
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Students are given annual feedback surveys, and exit interviews are conducted.
Evaluation status (In Progress or Complete) :	In progess (yearly)
Evaluator (Internal or External) :	Internal
External evaluator name:	N/A
Notes/additional info/data sources:	No systematic evaluation of the surveys or interview information occurs.
Contact Information	
Contact information:	Carla Rosenberg carla.b.rosenberg@nasa.gov
Notes/additional info/data sources:	David Seidel, Manager david.m.seidel@jpl.nasa.gov 818-354-9313
	Jenny Tieu, student program administrator jenny.tieu@jpl.nasa.gov 818-393-5386
Status	Verified, Complete

Related projects/activities:	NASA portal; NASA TV Public Services Channel; NASA TV Education Services Channel; SpaceLink; eClips; EFP
NASA informal initiative:	NETS-NASA Education Technology Services
Category:	Resources/Opportunities for Educators & Students
Location:	Multi-site (web based)
Duration:	N/A
Level (Project or Activity):	Project
Description:	NASA Education Technologies Services (NETS) is a cross-cutting NASA education technology project that prepares and delivers educational Web content for K-12 and higher education educators and students. NETS generates and maintains NASA Portal content about NASA education projects and audience-appropriate information about NASA research, missions and careers. It also supports the online presence for other agency education offerings. NETS staff comprises former classroom teachers, writers and a technical Web support team.
URL:	http://www.nasa.gov/audience/foreducators/ and http://www.nasa.gov/audience/forstudents/
Goals:	Provide formal curricular and informal education support resources; maintain educational content on NASA website, manage operations of OE website and other e-based dissemination and publishing networks
Year established:	Originated in the 1980s and formally established in 2003
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	Content on NASA Portal, Office of Education web site and other e-based dissemination/publishing networks. Additional web support is provided to the education video file (education programming) on the NASA TV Public Services channel and NASA TV Education Services channel.
Partner institution(s):	Disney for Buzzlight year project, Discovery Communications, United Media, USA Today, Disney-Pixar on Wall-E project
Notes/additional info/data sources:	http://www.nasa.gov/pdf/345945main_10_Education_F_%202010_UPDATED_final.pdf; Shelley Canwright's email (10/4); Education Performance Report FY08 (http://mynasa.nasa.gov/pdf/294774main_2008_ESE_NETS.pdf)
People Served	
Target audience:	Educators and students for K-12 and higher education
Eligibility criteria:	N/A
Competitive process or open to general public:	Open
# people served per year	During Fiscal Year 2008 (October 2007 – September 2008) there were 44,439,471 page views.
Notes/additional info/data sources:	Education Performance Report FY08 (http://mynasa.nasa.gov/pdf/294774main_2008_ESE_NETS.pdf)
Costs & Management	
Funding organization:	HQ-Elem/Sec/eEduc
Managing organization:	MSFC
Annual funding amount (by year):	$1,656,000 (FY09)
Per-participant cost (if available/applicable):	Cost per page view in FY08 was 3.2 cents.
Notes/additional info/data sources:	Education Performance Report FY08 (http://mynasa.nasa.gov/pdf/294774main_2008_ESE_NETS.pdf)
Evaluation	
Evaluation strategies:	N/A
Evaluation status (In Progress or Complete) :	N/A
Evaluator (Internal or External) :	N/A
External evaluator name:	N/A
Notes/additional info/data sources:	
Contact Information	
Contact information:	Mr. Jeff Ehmen Center Precollege Officer (Acting) Marshall Space Flight Center Academic Affairs Office Mail Stop HS30 Marshall Space Flight Center, AL 35812 Phone: 256-961-1567 Fax: 256-961-1521 E-mail: Jeff.Ehmen@nasa.gov
Notes/additional info/data sources:	
Status	Unverified, Complete

Related projects/activities:	NASA's eEducation Project, Digital Learning Network, INSPIRE
NASA informal initiative:	LTP- Learning Technologies Project
Category:	Resources/Opportunities for Students
Location:	Web-based/Multi-site
Duration:	N/A
Level (Project or Activity):	Project
Description:	NASA's Learning Technologies Project (LTP) is a NASA-wide education technology development initiative. LTP supports the development of projects that deliver NASA content through revolutionary technologies to enhance education in the areas of science, technology, engineering and mathematics (STEM). Research and development are at the core of the LTP mission. The Learning Technologies Project is part of NASA's eEducation Project and is NASA's educational technology incubator. LTP seeks to enhance formal and informal education in STEM fields with the goal of increasing the number of students in those fields of study. The Learning Technologies Project combines the talents of educators, industry, academia, non-profit organizations and NASA's Mission Directorates to develop educational technologies that enable, empower, and educate learners of diverse backgrounds, characteristics, and abilities.
URL:	http://www.nasa.gov/offices/education/programs/national/ltp/home/index.html
Goals:	Enhance formal and informal education in STEM fields to increase the number of students in those fields of study.
Year established:	1996
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	LTP hosts over 50 online projects that deliver education materials to students. Technologies such as streaming media, interactive gaming, 3-D simulations and remote manipulation of scientific instruments are woven into curricular studies to promote academic achievement in K-12 math and science. Some notable projects within the LTP include: Over Ranch, NASA Qwhiz, Quest, the Learning Technologies Channel, FoilSim, Telescopes in Education and the WHY? Files.
Partner institution(s):	In FY08, Learning Technologies worked closely with the following partners: * The America's Army Project Team in collaboration on the design of a NASA-based, commercial quality game prototype. * The Federation of American Scientists in collaboration of the NASA eEducation research roadmap follow up and design of a NASA-based, commercial quality game prototype. * The Federal Consortium for Virtual Worlds as an active member building resource and information sharing networks for virtual worlds between government agencies. * The JSC Learning Technologies team on all elements of Second Life work and research and virtual worlds' accessibility research. * The GSFC Innovative Partnership Program Office and GSFC Patent Law Office and General Counsel's Office were invaluable partners in the developing and executing the concept of a targeted, non-reimbursable space act agreement for a solicitation tool for an innovative education project. During FY08, the LT project office shared information and insights in the areas of game and virtual world technology with or on behalf of Informal, Formal and Higher Education, the Exploration Systems and Space Operations Mission Directorates, the Digital Learning Network, Classroom of the Future, INSPIRE, Goddard, Langley, Marshall and Ames.
Notes/additional info/data sources:	This is Shelley's incubator (R&D) project that is responsible for testing and building new tools, products etc. Education Performance Report FY08 (http://mynasa.nasa.gov/pdf/294772main_2008_ESE_LTP.pdf); http://adsabs.harvard.edu/abs/2003AGUFMED32D..06F http://www.icte.org/T01_Library/T01_221.PDF NASA's Fiscal Year 2010 BUDGET ESTIMATES Document
People Served	
Target audience:	K-12 students, undergraduates
Eligibility criteria:	N/A
Competitive process or open to general public:	Open to the public
# people served per year	179,000 participants in FY09
Notes/additional info/data sources:	http://adsabs.harvard.edu/abs/2003AGUFMED32D..06F http://www.teachearth.com/programs/LTP.html
Costs & Management	
Funding organization:	HQ-Elem/Sec/eEduc
Managing organization:	GSFC
Annual funding amount (by year):	$1,187,000 (FY09) $1,900,000 (FY08-budget request) $2,990,000 (FY07- Budget request doc FY 2007; $2.9M was cited in the budget request FY 2008) $1,500,000 (FY 06 -assuming baseline cited in budget request FY 2007 was FY06 budget) $3,800,000 (FY2003 budget request) $3,800,000 (FY2002 budget request) -- (FY2001, per budget re FY2003)
Per-participant cost (if available/applicable):	$3.23 per participant
Notes/additional info/data sources:	http://mynasa.nasa.gov/pdf/168652main_NASA_FY08_Budget_Request.pdf http://mynasa.nasa.gov/pdf/142458main_FY07_budget_full.pdf http://mynasa.nasa.gov/pdf/118829main_FY03_budget.pdf
Evaluation	
Evaluation strategies:	none.
Evaluation status (In Progress or Complete) :	none.
Evaluator (Internal or External) :	none.
External evaluator name:	none.
Notes/additional info/data sources:	
Contact Information	
Contact information:	Dan Laughlin, Project Manager UMBC GEST NASA Goddard Space Flight Center daniel.d.laughlin@nasa.gov Phone: 301-286-1112
	Stephanie Smith & Terry Hodgson Technical Office/Information Accessibility Lab NASA Johnson Space Center jsc-learntech@mail.nasa.gov Phone: 281-244-5765
Notes/additional info/data sources:	
Status	Unverified, Complete

Related projects/activities:	None
NASA informal initiative:	K-12 Competitive Grants Opportunity (K12CG)
Category:	Resources (PD) for Educators
Location:	Multi-site
Duration:	Grants are for 2 years
Level (Project or Activity):	Project
Description:	The K-12 Competitive Grants Opportunity (K12CG) is a competitive education grant program targeting secondary school level teaching and learning, with grants being awarded to U.S. public schools and non-profit organizations. The goal of the opportunity is to seek out and support new, innovative, and replicable approaches to improving STEM learning and instruction. This will leverage NASA's unique contributions to STEM fields.
URL:	http://nspires.nasaprs.com/external/viewrepositorydocument/cmdocumentid=152706/K12%20Competitive%20Grants%20Opportunity%20Solicitation.pdf
Goals:	Use the STEM content of NASA's missions to develop, promote, or utilize new, innovative, and replicable approaches to improving STEM learning and instruction; provide experiences and activities that are grounded in education research or utilize evidence-supported approaches, techniques, and tools; and build linkages and connections to and from secondary education and higher education and informal education communities.
Year established:	2008
History (Congressionally Mandated or Discretionary):	Congressionally directed in 2008 and 2009; currently awaiting 2010 direction
Products produced:	Funded projects are to produce activities or experiences that support secondary STEM instruction/learning, including products or services that utilize eEducation and/or education technology tools; or provide electronic dissemination of new or repurposed NASA content; and, professional development opportunities for in-service or pre-service educators, related to NASA content and targeting secondary education.
Partner institution(s):	Awardees and awardees' partners
Notes/additional info/data sources:	http://www.nasa.gov/home/hqnews/2008/jul/HQ_08180_competitive_grants.html (accessed 9/15/09)
People Served	
Target audience:	Secondary school level teaching and learning with grants being awarded to U.S. public schools and non-profit organizations
Eligibility criteria:	Proposals will be accepted from U.S. public secondary schools, school districts, state-based education leadership, and not-for-profit education organizations that support secondary education. Universities, industry, education-related companies, and other institutions may apply through partnership with the lead organization.
Competitive process or open to general public:	Competitive
# people served per year	12 awards in 2008 (currently reviewing 2009 submissions)
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	HQ-Elem/Sec/eEduc
Managing organization:	GSFC
Annual funding amount (by year):	$16,000,000 (FY09)
Per-participant cost (if available/applicable):	Awards range from $750K – $1.5M total for a two-year period.
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	N/A
Evaluation status (In Progress or Complete) :	N/A
Evaluator (Internal or External) :	N/A
External evaluator name:	N/A
Notes/additional info/data sources:	
Contact Information	
Contact information:	Dr. Antoinette C. Wells Chief, Education Office NASA Goddard Space Flight Center Greenbelt, MD 20771 -0001 Phone: (301) 286-7262 Fax: (301) 286-1655 E-mail: Antoinette.C.Wells@nasa.gov
	Shelley Canright, Ph.D. (referenced in RFP) Office of Education NASA Headquarters 300 E St. SW Washington, DC 20546 Shelley.Canright@nasa.gov
Notes/additional info/data sources:	
Status	Unverified, Complete

Related projects/activities:	EFP, LEARN, LTP
NASA informal initiative:	INSPIRE - Interdisciplinary National Science Program Incorporating Research and Education Experience
Category:	Resources/Opportunities for Students
Location:	Multi-Site (online); summer experiences at all nine NASA centers and the Jet Propulsion Laboratory
Duration:	Online Learning Communities (OLCs) take place year round; optional program take place during the summer for OLC participants
Level (Project or Activity):	Project
Program/Outcome:	Elementary/Secondary/eEducation (Outcome 2)
Description:	INSPIRE is a STEM career exploration project for high school students in grades 9th through freshman year of college centered around INSPIRE's extensive online community (OLC) where they and their parents have access to activities and resources and interact with peers, NASA experts and education specialists. INSPIRE's OLC students are also eligible to compete for enriching summer hands-on experiences including a center workshop and tour, a two-week collegiate experience, and internships designed to maximize student involvement in STEM education. This agency-wide project is managed by KSC and implemented at all 9 NASA centers and the Jet Propulsion Laboratory (JPL).
URL:	http://www.nasa.gov/education/INSPIRE
Goals:	1. Serve as a nationwide project to develop emerging adolescent and parental awareness and understanding of STEM-related education and careers. 2. Engage students and families with grade appropriate resources and activities/educational modules and provide the capability for them to interact, ask questions, and share knowledge with their peers through participation in an on-line community. 3. Provide unique NASA/STEM experiences to students and their families to further inspire and reinforce student's aspirations to pursue STEM education and families to support their student's pursuits.
Year established:	2008
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	n/a (other than work produced by participating students)
Partner institution(s):	Oklahoma State University; to broaden the underrepresented and underserved student participation, OSU has partnered with the National Science Foundation's Louis Stokes Alliances for Minority Participation (LSAMP), the American Indian Science and Engineering Society (AISES), and Hispanic Serving Institutions; Tier 2 collegiate experience held at University of Puerto Rico, Virginia Tech, and South Dakota School of Mines & Technology
Notes/additional info/data sources:	NASA INSPIRE Interns Work to Become Future Explorers and Innovators. (2008, August). Cost Engineering, Retrieved September 14, 2009, from Business Source Corporate database. Education Performance Report 2008 (http://mynasa.nasa.gov/pdf/294770main_2008_ESE_INSPIRE.pdf, retrieved 10/13/09) NASA Awards Education Grants to Universities (press release: 4/6/09, which Shelley sent)
People Served	
Target audience:	Pre-college (9th-12th grade) and post-secondary (rising college freshmen) students interested in STEM education and careers
Eligibility criteria:	For the OLC, applicants must: be entering 9-12th grade, be at least 13 years old, a U.S. citizen, have a minimum 2.5 GPA on a 4.0 scale, demonstrate the desire and the academic preparation to pursue a STEM-related field of study beyond high school, complete the online application process with all required documentation. For the summer experiences, applicants must: be an active participant in the OLC, have a 3.0 GPA on a 4.0 scale, submit updated transcripts, recommendations and parental consent forms and other documentation as instructed.
Competitive process or open to general public:	Competitive
# people served per year	(FY09): 1,318 students (FY08) 154 students representing 23 states and Puerto Rico; 131 NASA and contractor employees participated in the mentoring aspects of the project
Notes/additional info/data sources:	NASA INSPIRE Interns Work to Become Future Explorers and Innovators. (2008, August). Cost Engineering, Retrieved September 14, 2009, from Business Source Corporate database. Education Performance Report 2008 (http://mynasa.nasa.gov/pdf/294770main_2008_ESE_INSPIRE.pdf, retrieved 10/13/09)
Costs & Management	
Funding organization:	HQ-Elem/Sec/eEduc
Managing organization:	Kennedy Space Center
Annual funding amount (by year):	2009 - $3,735,000; 2008- $3,735,000 (based on report in Budget Request 2009 that states no change in project value between 2008 and 2009)
Per-participant cost (if available/applicable):	FY09 $86.26
Notes/additional info/data sources:	Budget Request - FY 2009
Evaluation	
Evaluation strategies:	"Internal" evaluation of the project is done through the Technology for Learning Consortium, Inc.
Evaluation status (In Progress or Complete) :	In process
Evaluator (Internal or External) :	Internal evaluation
External evaluator name:	Okalahoma State University and Technology for Learning Consortium, Inc.
Notes/additional info/data sources:	Education Performance Report 2008 (http://mynasa.nasa.gov/pdf/294770main_2008_ESE_INSPIRE.pdf, retrieved 10/13/09) Per Shelley Canright (email 2/25/09): over last year, released & awarded procurements for activities where evaluation as an important attribute. Look at evaluators and will see shared one with EFP, INSPIRE, and SEMAA. Contact Hilarie Davis of Technology for Learning Consortium

Contact Information	
Contact information:	Steve Chance, Steven.H.Chance@nasa.gov (321) 867-4194
	Hilarie Davis, hilarie@techforlearning.org
Notes/additional info/data sources:	
Status	Unverified, Complete

Related projects/activities:	Central Operation of Resources for Educators (CORE), Educator Resource Center Network (ERCN)
NASA informal initiative:	eEducation Small Projects (CORE)
Category:	Resources Targeting the General Public
Location:	Multi-site
Duration:	Varies by product; e.g., one DVD is 21 minutes and one is 60 minutes
Level (Project or Activity):	Project
Description:	eEducation Small Projects is an umbrella term for an infrastructure for distributing NASA research-based technology applications, products, and materials to enhance the educational instruction of K-12 and informal educators. The primary small project is the NASA-sponsored Central Operation of Resources for Educators (CORE) which, in coordination with the Educator Resource Center Network (ERCN), provides educators access to NASA-developed educational products and materials. Operated through a cooperative agreement with Lorain County Joint Vocational School in Oberlin, Ohio, CORE serves as a world-wide distribution center for NASA-produced multimedia materials and coordinates communication related to product availability with the ERCN.
URL:	http://core.nasa.gov
Goals:	Primary objective is to distribute NASA multi-media products worldwide
Year established:	~1984
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	CORE provides following products: Exploring Earth Family Activity Kit, Field Trip to the Moon: LRO/LCROSS DVD, Space Faring: The Radiation Challenge DVD, Our Sun -- Yours to Discover Bulletin Board Set, Reading, Writing & Rings
Partner institution(s):	Lorain County Joint Vocational School
Notes/additional info/data sources:	No Education Performance Report on NASA website likely as this is a distribution, not content-based, project. http://www.nasa.gov/pdf/345945main_10_Education_F_%202010_UPDATED_final.pdf; Shelley's PROGRAM DESCRIPTIONS doc (sent to us 2/25/09)
People Served	
Target audience:	Varies by product; products suitable for students (all levels), parents, educators
Eligibility criteria:	None
Competitive process or open to general public:	Available to the public (small fee, e.g. $15, involved)
# people served per year	12,890 (FY09); 343 parcitipcants (walk-ins)
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	HQ-Elem/Sec/eEduc
Managing organization:	MSFC
Annual funding amount (by year):	$828,000 (FY09) $600,000 (FY08 budget request) $1,700,000 (FY07 budget request)
Per-participant cost (if available/applicable):	$44.72
Notes/additional info/data sources:	This is a cost-reimbursed program; cost per participant is increasing because additional activities are now being included in total costs.
Evaluation	
Evaluation strategies:	Included in a review of ERCs as a dissemination network of NASA's programs and materials and as provider of training via site visits and interviews
Evaluation status (In Progress or Complete) :	Completed
Evaluator (Internal or External) :	External
External evaluator name:	Harouna Ba and Naomi Hupert at EDC
Notes/additional info/data sources:	Have e-copy of evaluation
Contact Information	
Contact information:	Mr. Jeff Ehmen Center Precollege Officer (Acting) Marshall Space Flight Center Academic Affairs Office Mail Stop HS30 Marshall Space Flight Center, AL 35812 Phone: 256-961-1567 Fax: 256-961-1521 E-mail: Jeff.Ehmen@nasa.gov
	http://www.nasa.gov/offices/education/contacts/precoll.html - accessed 9/22/09
Notes/additional info/data sources:	
Status	Unverified, Complete

Related projects/activities:	CORE (provides strategic coordination); Digital Learning Network; additional projects that are creating products for educators; ERCs
NASA informal initiative:	Educator Resource Centers Network (formerly, Teacher Resource Centers Network)
Category:	Resources (PD) for Educators
Location:	Multi-site (11 NASA Field Center ERCs and 67 State ERCs)
Duration:	N/A
Level (Project or Activity):	Unfunded collaboration
Description:	NASA Educator Resource Center (ERC) Network helps teachers learn about and use NASA's educational resources. Personnel at ERCs located throughout the United States work with teachers to find out what they need and to share NASA's expertise. The ERCs provide educators with demonstrations of educational technologies such as NASA educational Web sites and NASA Television. ERCs provide inservice and preservice training utilizing NASA instructional products. Educators also have the opportunity to preview, copy and receive NASA instructional products. The Field Center ERCs are located on or near NASA centers. These ERCs service educators from states within their geographical region. These ERCs have a close association with NASA specialists, scientists and engineers who often act as resources for workshops and special events.
URL:	http://www.nasa.gov/audience/foreducators/k-4/learning/F_Educator_Resource_Center_Network.html
Goals:	The purpose of a NASA Educator Resource Center (ERC) and its network is to help teachers learn about and use NASA's educational resources.
Year established:	1999
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	Will be producing an operations manual
Partner institution(s):	n/a
Notes/additional info/data sources:	Per Shelley (10/8/09), ERCN functions as an umbrella program/project; there's strategic coordination for the Network but ultimately, the ERCs are accountable to their Centers (not the Network). As a result, some ERCs will have more performance and accountability data than others. Per Shelley (10/15/09): ERCs began as a means to distribute NASA materials, DVDs, slide shows etc. Overtime, became responsible for dissemination, which includes both distribution of materials as well as training on how to use the materials.
People Served	
Target audience:	Formal and informal educators
Eligibility criteria:	N/A
Competitive process or open to general public:	Open
# people served per year	37,478 (FY09)
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	Office of Education
Managing organization:	Each ERC is managed by its Center
Annual funding amount (by year):	2009 - $0
Per-participant cost (if available/applicable):	N/A (not funded)
Notes/additional info/data sources:	Largely an unfunded network; some field ERCs may receive dollars from the Center, Mission Directorate etc.
Evaluation	
Evaluation strategies:	Review of ERCs as a dissemination network of NASA's programs and materials and as provider of training via site visits and interviews
Evaluation status (In Progress or Complete) :	Completed
Evaluator (Internal or External) :	External
External evaluator name:	Harouna Ba and Naomi Hupert at EDC
Notes/additional info/data sources:	Have e-copy of evaluation
Contact Information	
Contact information:	Jeff Ehmen (strategic coordinator), Marshall Space Flight Center
Notes/additional info/data sources:	
Status	Unverified, Complete

Related projects/activities:	In FY08, EFP was managed with Educator Astronaut Project (EAP); ERP will take over EAP in FY09 SEMAA; INSPIRE; NES; Center Education Offices; AESP; DLN; NETS; EVA Project Office; Space Shuttle Program; Delta Researchers Schools; Challenger Centers; Dryde
NASA informal initiative:	EFP-Education Flight Projects (Teaching From Space)
Category:	Resources/Opportunities for Educators & Students
Location:	Multi-site
Duration:	Varies
Level (Project or Activity):	Project
Description:	Education Flight Projects (EFP) are a series of NASA K-12 educational opportunities involving flights aboard the International Space Station, the Space Shuttle, and Sub-orbital Flight Platforms. EFP provides K-12 educators and students the opportunity to participate directly in NASA education experiences to enhance their schools' science, technology, engineering and mathematics curricula. EFP also facilitates the Network of Educator Astronaut Teachers (NEAT), a group of highly motivated K-12 educators, and provides professional development and support for the group.
URL:	http://education.nasa.gov/divisions/flightprojoffice/programs/
Goals:	Student Involvement K-12 - Provide K-12 students with authentic first-hand opportunities to participate in NASA mission activities, thus inspiring interest in STEM disciplines and careers; and to provide Educator Professional Development
Year established:	2003
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	Major project activities include: ISS Downlinks, Amateur Radio on the ISS (ARISS); ISS EarthKAM; Education Payload Operations (EPO); and on-orbit Education Demonstration Activities (EDA). Also facilitates the Network of Educator Astronaut Teachers (NEAT); has developed a comprehensive education web site that has the potential to highlight all existing NASA K-12 (expanding to K-16 in FY09) education flight activities. The site, scheduled to launch in FY09, will provide educators and students access to multiple flight opportunities, allowing them to participate in the pipeline of NASA education activities.
Partner institution(s):	International Technology Education Association (ITEA), US Department of Education, University of California – San Diego (UCSD), Sally Ride Science
Notes/additional info/data sources:	EFP was officially established in 2003, bringing together several existing projects. Beginning in 2006, EFP was to be overseen by the Teaching from Space Education Office at Johnson Space Center. http://www.nasa.gov/pdf/294769main_2008_ESE_EFP.pdf (accessed 10/1/09); http://cart.nap.edu/cart/deliver.cgi?record_id=12081&type=pdf_chapter&free=1 (accessed 10/1/09); Also, Shelley' Canright's docmuent, Elementary-Secondary/ eEducation PROGRAM PROJECT DESCRIPTIONS (sent 2/25/09)
People Served	
Target audience:	K-12 educators and students
Eligibility criteria:	To participate in EarthKAM, ARISS, or the in-flight downlinks, schools must submit a proposal that describes how the EFP activity will be integrated in the classroom and the intended learning outcomes. The proposals are then evaluated on the basis, first, of educational value, and, second, on whether the timing is possible given the flight schedule.
Competitive process or open to general public:	EarthKAM, ARISS, and the in-flight downlinks are competitive
# people served per year	In FY09, 20,703 participated in short programs, 287 in long-duration programs, and another 771,210 participated in enrichment activities; overlap with other programs has been removed from these figures In FY08, EFP reached a total of 1,442 educators and 71,083 students. This total includes both 30,007 direct participants and 41,076 indirect participants.
Notes/additional info/data sources:	http://www.nasa.gov/pdf/294769main_2008_ESE_EFP.pdf (accessed 10/1/09)
Costs & Management	
Funding organization:	HQ-Elem/Sec/eEduc
Managing organization:	JSC
Annual funding amount (by year):	$3,540,000 (FY09); $1,100,000 (budget request for FY 2008); $2,000,000 (budget request for 2007)
Per-participant cost (if available/applicable):	FY09 $4.15 per participant
Notes/additional info/data sources:	http://mynasa.nasa.gov/pdf/168652main_NASA_FY08_Budget_Request.pdf
Evaluation	
Evaluation strategies:	Benchmarking study of NEAT (now part of NFP) released in March 2008 that compares the NEAT framework against best practices in PD and networking EarthKAM's evaluation was conducted over 3 months using qualitative methods (interviews, site visits, review of relevant documents) to obtain an in-depth understanding of the status of the program implementation and its impact on participants. The data from the evaluation are limited as only four teachers were interviewed, and the data from NEEIS were not readily available in formats that allowed for data analyses.
Evaluation status (In Progress or Complete) :	Benchmarking study completed (March 2008) EarthKAM evaluation completed (2006)
Evaluator (Internal or External) :	Both are external
External evaluator name:	Haden and Wilkerson of Magnolia Consulting did NEAT Benchmarking Study Ba and Sosnowy of EDC did the EarthKAM evaluation
Notes/additional info/data sources:	Have an electronic copy of the benchmarking study For the EarthKAM evaluation, see National Academies' NASA's Elementary and Secondary Education Program: Review and Critique (2008) available at http://books.nap.edu/openbook.php?record_id=12081&page=61 Also found mention in Budget Request for FY09 of RCT to be conducted to determine the extent to which intervention programs positively or negatively compares to control groups which do not participate in the program for both EFP and AESP (however, Shelley was not aware of the AESP evaluation). http://mynasa.nasa.gov/pdf/210019main_NASA_FY09_Budget_Estimates.pdf Per Shelley Canright (email 2/25/09): over last year, released & awarded procurements for activities where evaluation as an important attribute. Look at evaluators and will several programs share one (EFP, INSPIRE, and NES). Contact Hilarie Davis.
Contact Information	
Contact information:	Ed Pritchard, EFP Project Manager NASA Johnson Space Center 281-483-4212 edward.j.pritchard@nasa.gov
Notes/additional info/data sources:	http://www.nasa.gov/pdf/294769main_2008_ESE_EFP.pdf (accessed 10/1/09)
Status	Unverified, Complete

Related projects/activities:	Flight Projects Office (taking video shot by astronauts in space and turning into clips); NETS
NASA informal initiative:	eClips
Category:	Resources Targeting the General Public
Location:	Multi-site
Duration:	n/a
Level (Project or Activity):	Project
Description:	NASA eClips is a curriculum supplement project that provides short, relevant educational video segments for grades K-5, 6-8, 9-12 and the general public. Thr project is run thorugh a cooperative agreement between NASA and the National Institute of Aerospace (NIA). eClips materials showcase NASA's mission, strengthen learners' understanding of present future science and technology innovations, and illustrate the connection between subjects taught in school with real world applications. The project is funded in FY09 with $2M in FY08 dollars.
URL:	http://www.nasa.gov/audience/foreducators/nasaeclips/index.html
Goals:	Support science curricula with material based on natural curriculum standards and to help educators and parents prepare students for STEM careers
Year established:	2008
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	eClips: Our World for Grades k-5, Real World for Grades 6-8, Launchpad for Grades 9-12; NASA 360 For Public
Partner institution(s):	National Institute of Aerospace (NIA), CaptionMax of Minneapolis, Internet Archive of San Francisco, YouTube
Notes/additional info/data sources:	http://www.physorg.com/news140968676.html; http://www.youtube.com/nasaeclips
People Served	
Target audience:	Grades K-12 and the general public
Eligibility criteria:	n/a
Competitive process or open to general public:	Open
# people served per year	Over 1 million page views via NASA portal and YouTube btw Oct 08 & July 09; an additional 117,000 in August
Notes/additional info/data sources:	http://www.nasa.gov/audience/foreducators/nasaeclips/index.html
Costs & Management	
Funding organization:	HQ-Elem/Sec/eEduc - will be transferred to Public Affairs
Managing organization:	Langely Research Center
Annual funding amount (by year):	$0 in FY09 (used $4,000,000 from 07 dollars channeled through 08)
Per-participant cost (if available/applicable):	$1.73 per page view for August 09; $2.00 per page view between October 08 and July 09
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	In Educational Broadcasting Programming for NASA eClips, evaluators analyzed lessons and conducted focus groups to understand how well eClips' lessons conform to the 5 E Model & National Science Education Standards as well as teachers' percetions of the lessons and videos
Evaluation status (In Progress or Complete) :	First year of evaluation completed (annual report submitted June 3, 2009)
Evaluator (Internal or External) :	External
External evaluator name:	Jason Osborne and Kimberly Cohen, North Carolina State University
Notes/additional info/data sources:	Have copy of June 3, 2009 evaluation document
Contact Information	
Contact information:	Troy Merryfield troy.merryfield@nasa.gov 757-864-8703
Notes/additional info/data sources:	
Status	Unverified, Complete

Related projects/activities:	SEMAA, INSPIRE, NASA Explorer Schools, NFP
NASA informal initiative:	AESP - Aerospace Education Services Project
Category:	Resources (PD) for Educators
Location:	Multi-site
Duration:	Year round
Level (Project or Activity):	Project
Description:	AESP is a comprehensive education support project that provides professional development and other education services to the formal and informal education communities in all 50 states and U.S. territories. AESP employs full-time education specialists who are based at each NASA Center and travel extensively throughout the United States. The project offers professional development opportunities and appropriate NASA education resources for the elementary and secondary education community through classroom demonstrations, distance learning events, in service training for educators, pre-service training for university students, and other educational activities. The primary goal is to encourage students to pursue studies of science, technology, engineering and mathematics that could lead to careers in the NASA workforce pipeline.
URL:	www.nasa.gov/education/aesp
Goals:	The primary goal is to encourage students to pursue studies of science, technology, engineering and mathematics that could lead to careers in the NASA workforce pipeline. AESP works to attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty.
Year established:	~1960s (longest running project, which has been around for 40 some years)
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	
Partner institution(s):	Pennsylvania State University's Center for Science and the Schools
Notes/additional info/data sources:	A secondary component of the program includes classroom visits, where NASA directly interfaces with students. Robots on the Road, a traveling program designed to help students understand how robots operate, is a separate project, an add-on to AESP, not a product of AESP. http://aesp.psu.edu/; http://www.nasa.gov/pdf/294766main_2008_ESE_AESP.pdf;
People Served	
Target audience:	Teachers and informal educators of Grades K-12
Eligibility criteria:	n/a
Competitive process or open to general public:	Open to the Public
# people served per year	In FY09, 7,999 teachers participated in short duration PD, 4,363 participated in long duration programs for a total of 12,362 teachers In FY08, 11,282 teachers (4,964 teachers in PD programs of less than 2 days and 6,318 in longer-duration PD); 61,418 s
Notes/additional info/data sources:	http://aesp.psu.edu/; http://mynasa.nasa.gov/pdf/294766main_2008_ESE_AESP.pdf
Costs & Management	
Funding organization:	HQ-Elem/Sec/eEduc
Managing organization:	Langely Reseach Center
Annual funding amount (by year):	FY09 $5,888,000 FY08 (budget request) $5,300,000
Per-participant cost (if available/applicable):	$23.98 per participant FY09 (includes teachers and students in denominator)
Notes/additional info/data sources:	Budget Request FY 2008 (http://mynasa.nasa.gov/pdf/168652main_NASA_FY08_Budget_Request.pdf)
Evaluation	
Evaluation strategies:	Surveys, document reviews, interviews, focus groups, and site visits to examine how well program is meeting its goals
Evaluation status *(In Progress or Complete)* :	Completed (2004)
Evaluator *(Internal or External)* :	External
External evaluator name:	Jerry Horn and Kenneth McKinley of the Evaluation Center at Western Michigan University
Notes/additional info/data sources:	Also found mention in Budget Request for FY09 of RCT to be conducted to determine the extent to which intervention programs positively or negatively compare to control groups which do not participate in the program for both EFP and AESP. Shelley was not aware of any such AESP evaluation. http://mynasa.nasa.gov/pdf/210019main_NASA_FY09_Budget_Estimates.pdf
Contact Information	
Contact information:	Michelle Ferebee, NASA AESP Manager michelle.t.ferebee@nasa.gov 757-864-5617
	Bill Carlsen, Director wcarlsen@psu.edu 814-865-3525
Notes/additional info/data sources:	
Status	Incomplete, unverified

Related projects/activities:	NASA Careers Web site; Sight/Insight Project (www.hubble-sightinsight.com)
NASA informal initiative:	USA Today Project: No Boundaries
Category:	Resources/Opportunities for Students
Location:	Multi-site (web-based)
Duration:	Approximately 3 weeks (may be extended depending on rigor) Steps 1 & 2 – Preliminary Research – 1 class period Step 3 – Individual Investigation – 2-3 class periods Step 4 – No Boundaries Project – 2 weeks
Level (Project or Activity):	Project
Description:	No Boundaries is a team-based web competition for high school students. The project introduces students to NASA STEM careers and career planning. Teams submit final projects to be judged and the winning team receives a monetary award, an invitation to a launch, and the opportunity to present to NASA personnel.
URL:	http://www.noboundaries-stemcareers.com
Goals:	Develop a workforce of the future; attract and retain students in science, technology, engineering and math (STEM); and find the best and the brightest young people.
Year established:	2008
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	Student final projects
Partner institution(s):	USA Today Education; various dissemination partners such as NSTA, various museums, Girl Scouts USA, journals, 4H Clubs
Notes/additional info/data sources:	http://www.usatoday.com/educate/NASA/pdf_html/Teacher.htm
People Served	
Target audience:	Students in grades 7-12
Eligibility criteria:	N/A
Competitive process or open to general public:	Open to the public
# people served per year	2009 - Web page views (177,000); submissions (approx 200-250); # of unique visitors (48,000)
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	Mission-SOMD
Managing organization:	HQ-SOMD
Annual funding amount (by year):	$35,000 (FY09)
Per-participant cost (if available/applicable):	N/A
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Workshop evaluation of professional development for teachers on how to develop a submission.
Evaluation status (In Progress or Complete) :	Ongoing
Evaluator (Internal or External) :	N/A
External evaluator name:	N/A
Notes/additional info/data sources:	There is data available: worksheets that teachers filled out and a sample of responses to each question.
Contact Information	
Contact information:	Carla Rosenberg, carla.b.rosenberg@nasa.gov
Notes/additional info/data sources:	
Status	Unverified, Incomplete

Related projects/activities:	
NASA informal initiative:	Summer Institute in Science, Technology, Engineering and Research
Category:	Resources/Opportunities for Students
Location:	Greenbelt, MD
Duration:	5 days during the summer
Level (Project or Activity):	
Description:	SISTER is a STEM career exploration project for female middle school students. The project is designed to increase awareness of and provide an opportunity for participants to be exposed to and explore nontraditional career fields with NASA Goddard Space Flight Center (GSFC) women engineers, mathematicians, scientists, technicians and researchers. The project teaches participants about education programs and internships available during high school, undergraduate and graduate study, and it provides observations and experiences with real hands-on projects research and developed by women at GSFC.
URL:	http://education.gsfc.nasa.gov/sister/2008sister_application1.pdf
Goals:	The project is designed to increase awareness of and provide an opportunity for participants to be exposed to and explore nontraditional career fields with NASA Goddard Space Flight Center (GSFC) women engineers, mathematicians, scientists and technicians.
Year established:	
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	None
Partner institution(s):	
Notes/additional info/data sources:	
People Served	
Target audience:	Middle school girls
Eligibility criteria:	Must: be female; be a US citizen; be entering 7th or 8th grade (cited as 6-8th grade in other sources); have at least a B average in science and math
Competitive process or open to general public:	Competitive
# people served per year	
Notes/additional info/data sources:	http://democrats.science.house.gov/Media/File/Commdocs/hearings/2009/Research/21jul/Hearing_Charter.pdf
Costs & Management	
Funding organization:	Center - GSFC
Managing organization:	GSFC
Annual funding amount (by year):	$1,000
Per-participant cost (if available/applicable):	
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	
Evaluation status (In Progress or Complete) :	
Evaluator (Internal or External) :	
External evaluator name:	
Notes/additional info/data sources:	
Contact Information	
Contact information:	Terri Patterson, Phone: 301-286-4398, Terri.J.Patterson@nasa.gov
Notes/additional info/data sources:	
Status	No Response from Project Staff

Related projects/activities:	University Student Launch Initiative (USLI)
NASA informal initiative:	Student Launch Initiative
Category:	Resources/Opportunities for Students
Location:	Multi-site
Duration:	8 months
Level (Project or Activity):	
Description:	The NASA Student Launch Initiative (SLI) is a systems engineering challenge for middle and high school students. Participants design, build and launch a reusable rocket that carries a science payload to an altitude of 1 mile above ground level. The challenge is an 8-month commitment for formal education teams or informal teams (such as scouting groups) to engage in a hands-on, systems engineering project that models NASA's technical review processes. Teams placing in the top of the Team America Rocketry Challenge (TARC) and the Rockets for Schools competitions are invited to send one teacher or mentor to a 4-day Advanced Rocketry Workshop where participants are immersed in developing an SLI team, understanding high-powered rocketry, and using NASA's education resources for their classroom. Workshop participants must submit a competitive proposal to be considered for advancement in SLI.
URL:	http://www.nasa.gov/offices/education/programs/descriptions/Student_Launch_Initiative.html (accessed 9/15/09)
Goals:	Allow students to demonstrate proof-of-concept for their designs and gives previously abstract concepts tangibility
Year established:	1999 (needs verification from contact)
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	Each team builds a rocket and submits a final report on the the rocket's performance. Teams are also required to provide at least 2 outreach projects to engage younger students and teach them the basics of rocketry, and they are to create a web site to document their efforts and provide information about their design, including photos and videos.
Partner institution(s):	Aerospace Industries Association, National Association of Rocketry, and Rockets for Schools
Notes/additional info/data sources:	http://www.nasa.gov/pdf/359912main_SLI_NASA_Prize.pdf (accessed 9/15/09) http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20090019101_2009016487.pdf
People Served	
Target audience:	Students in grades 7-12
Eligibility criteria:	Teams can qualify to participate in the Student Launch Initiative by placing in the top level two teams at the Rockets for Schools competition held in Wisconsin or by placing in the top at the Team America Rocketry Challenge, or TARC, held in Virginia.
Competitive process or open to general public:	Competitive
# people served per year	14 students teams (7th -12th grade) from 7 states participated in April 2009
Notes/additional info/data sources:	http://www.nasa.gov/centers/marshall/news/news/releases/2009/09-035.html (accessed 9/15/09)
Costs & Management	
Funding organization:	Mission-SOMD
Managing organization:	MSFC
Annual funding amount (by year):	$95,000 (FY09)
Per-participant cost (if available/applicable):	For the 2009-2010 competition, each team receives a grant of at least $2,500.
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Workshop evaluation of professional development for teachers on how to develop a submission (awaiting further clarification from contact)
Evaluation status (In Progress or Complete) :	Ongoing
Evaluator (Internal or External) :	Internal
External evaluator name:	N/A
Notes/additional info/data sources:	
Contact Information	
Contact information:	Julie Clift/WILL Technology, SLI/USLI Projects Lead NASA/Marshall Space Flight Center Academic Affairs Office Mail Code HS30 Marshall Space Flight Center, AL 35812 Phone: 256-961-1334 Fax: 256-961-1521 E-mail: julie.d.clift@nasa.gov
	Sabrina Pearson/WILL Technology, SLI/USLI Projects Coordinator NASA/Marshall Space Flight Center Academic Affairs Office Mail Code HS30 Marshall Space Flight Center, AL 35812 Phone: 256-961-0141 Fax: 256-961-1521 E-mail: sabrina.m.pearson@nasa.gov
Notes/additional info/data sources:	
Status	Unverified, Incomplete

Related projects/activities:	N/A
NASA informal initiative:	On the Moon Engineering Design Challenge
Category:	Resources (PD) for Educators
Location:	Multi-site (available online)
Duration:	Challenges take about an hour
Level (Project or Activity):	Project (Product)
Description:	On the Moon is an engineering design challenge educator guide for teachers of 3rd-12th grade formal or informal (such as scout groups) STEM students. NASA and PBS's "Design Squad" have developed the materials, which contain hands-on, inquiry-based activities related to NASA's Lunar Reconnaissance Orbiter and NASA's Lunar Crater Observation and Sensing Satellite missions.
URL:	www.nasa.gov/education/moonguide
Goals:	Provide activities that are effective, innovative ways to engage students in the engineering design process, encourage their interest in space exploration, and inspire them to pursue a career in engineering.
Year established:	2007
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	On the Moon Guide with six challenge activities (link below); online teacher training workshop at http://pbskids.org/designsquad/parentseducators/workshop/welcome.html
Partner institution(s):	"Design Squad," a TV show on PBS
Notes/additional info/data sources:	http://www.nasa.gov/pdf/308966main_On_the_Moon.pdf (retrieved 9/15/09)
People Served	
Target audience:	Teachers of 3rd to 12th grade STEM students
Eligibility criteria:	N/A
Competitive process or open to general public:	Open
# people served per year	N/A
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	Mission-ESMD
Managing organization:	MSFC
Annual funding amount (by year):	$292,000 (FY09)
Per-participant cost (if available/applicable):	N/A
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	There is an On the Moon educator reply card in the back of the book.
Evaluation status (In Progress or Complete) :	N/A
Evaluator (Internal or External) :	N/A
External evaluator name:	N/A
Notes/additional info/data sources:	
Contact Information	
Contact information:	Al Krause Education Specialist WILL Technology, Inc. NASA Marshall Space Flight Center, Huntsville, AL 35812 al.krause@nasa.gov 256-961-1354
Notes/additional info/data sources:	
Status	Verified, Complete

Related projects/activities:	N/A
NASA informal initiative:	NASA-Alabama A&M High School Senior Day
Category:	Resources/Opportunities for Students
Location:	Huntsville, AL
Duration:	1 day
Level (Project or Activity):	Project
Description:	NASA-Alabama A&M High School Senior Day is a collaborative effort between Alabama A&M University and NASA/MSFC. This annual event is designed to inspire our next generation of explorers to attend college and major in STEM fields. The project engages students in conversations with NASA personnel about aerospace careers, informs them about NASA's space exploration missions and current/future projects, and provides information about NASA education and college opportunities.
URL:	N/A
Goals:	To inspire our next generation of explorers to attend college and major in STEM fields.
Year established:	1997 (project contact will check date)
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	N/A
Partner institution(s):	Alabama A&M University
Notes/additional info/data sources:	http://www.msfc.nasa.gov/news/news/releases/2001/01-345.html
People Served	
Target audience:	High school seniors
Eligibility criteria:	N/A
Competitive process or open to general public:	Open
# people served per year	2007 - 2,800; 2008 - 2,500
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	SOMD
Managing organization:	MSFC
Annual funding amount (by year):	2009 - $30,000
Per-participant cost (if available/applicable):	2008 - $12 ($30,000/2500 participants)
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Paper evaluation forms from students
Evaluation status (In Progress or Complete) :	Ongoing
Evaluator (Internal or External) :	N/A
External evaluator name:	N/A
Notes/additional info/data sources:	Response is low - takes place at football game or venue
Contact Information	
Contact information:	Madeline Hereford, Madeline.E.Hereford@ nasa.gov
Notes/additional info/data sources:	
Status	Unverified, Incomplete

Related projects/activities:	None
NASA informal initiative:	NASA/Morgan State Summer Institute of Robotics
Category:	Resources/Opportunities for Students
Location:	MD, PA, NY
Duration:	2 2-week sessions
Level (Project or Activity):	Project
Description:	The NASA/Morgan State University Summer Institute of Robotics (SIR) is a STEM career exploration project for high school students. The project was developed in 2006 as a collaborative program between the NASA Robotics Academy at Goddard and Morgan State University. The program is a four-week session designed to provide 25-30 students the opportunity to learn and discover the science and technology of robot design and operation. The program is focused on recruiting from underrepresented/urban city populations.
URL:	http://www.nasa.gov/offices/education/programs/descriptions/Morgan_State_University_Summer_Institute_Robotics.html
Goals:	The mission of the Summer Institute of Robotics is to increase the knowledge and understanding of the concepts and principles of robotics for urban high school students with an interest in careers in science, technology, engineering and mathematics, or STEM.
Year established:	2006
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	
Partner institution(s):	NASA Robotics Academy at GSFC/FIRST Project
Notes/additional info/data sources:	
People Served	
Target audience:	Students grades 9-12
Eligibility criteria:	
Competitive process or open to general public:	Competitive
# people served per year	25-30
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	Center - GSFC
Managing organization:	GSFC
Annual funding amount (by year):	2009 - $10,000
Per-participant cost (if available/applicable):	Approximately $333-$400
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	
Evaluation status (In Progress or Complete) :	
Evaluator (Internal or External) :	
External evaluator name:	
Notes/additional info/data sources:	
Contact Information	
Contact information:	David Rosage, David.Rosage@gsfc.nasa.gov
Notes/additional info/data sources:	
Status	No Response from Project Staff

Related projects/activities:	N/A
NASA informal initiative:	Michael P. Anderson Summer Outreach
Category:	Resources/Opportunities for Students
Location:	Alabama A&M University in Huntsville, AL
Duration:	3 weeks
Level (Project or Activity):	
Description:	The Michael P. Anderson Summer Outreach Project is a 3-week intensive, non-residential hands-on leaning experience in fields of engineering and science which targets high achieving minority and female high school students. Students participate in a campus-based academic camp at the Alabama A&M University. The project uses competitions and engineering design challenges to teach students about various fields of science and engineering. It also involves parents by enlisting their support to encourage students to pursue college and major in STEM fields.
URL:	http://engr.aamu.edu/outreach NOTE: hyperlink not working (9/15/09)
Goals:	To engage high school students in hands-on learning experiences in engineering that create an awareness of varied engineering careers as well as the skills required to prepare for such careers. To develop students' mastery of mathematics, especially as it relates to engineering.
Year established:	contact will check
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	N/A
Partner institution(s):	Alabama A&M University's School of Engineering Technology
Notes/additional info/data sources:	http://eo.msfc.nasa.gov/smsp.html#mikem (accessed 9/15/09); http://www.nasa.gov/pdf/229698main_2007_ESE_SummerOutreach.pdf (accessed 9/15/09)
People Served	
Target audience:	High-achieving underserved minority or female high school students
Eligibility criteria:	Students completing 9th, 10th or 11th grade and have a strong interest in science, math & technology
Competitive process or open to general public:	Competitive
# people served per year	19 students from 12 high schools participated in FY 2007; 20 students in FY 2008
Notes/additional info/data sources:	http://eo.msfc.nasa.gov/smsp.html#mikem (accessed 9/15/09); http://www.nasa.gov/pdf/229698main_2007_ESE_SummerOutreach.pdf (accessed 9/15/09)
Costs & Management	
Funding organization:	Mission-SOMD
Managing organization:	MSFC
Annual funding amount (by year):	$100,000 (FY09)
Per-participant cost (if available/applicable):	FY08: $2,500 ($50,000/20 students)
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Evaluations done online by students. The data exists but has not been analyzed/compiled.
Evaluation status (In Progress or Complete) :	Ongoing
Evaluator (Internal or External) :	N/A
External evaluator name:	N/A
Notes/additional info/data sources:	
Contact Information	
Contact information:	Marilyn H. Lewis, Ed.D./WILL Technology Minority University Programs NASA Marshall Space Flight Center HS30/Academic Affairs Office Huntsville, AL 35812 Phone: 256-961-1336 Fax: 256-961-1521 E-mail: Marilyn.H.Lewis@nasa.gov
	Dr. Trent Montgomery, (256) 372-5463
	Bianca McDuffie, School of Engineering and Technology, Alabama A&M University, (256) 372-8284, bianca.mcduffie@aamu.edu
Notes/additional info/data sources:	http://www.nasa.gov/pdf/229698main_2007_ESE_SummerOutreach.pdf (accessed 9/15/09); http://www.josephmerrell.net/blogs/joseph__merrell/archive/2009/5/25/alabama-a-m-2009-summer-programs.aspx (accessed 9/15/09)
Status	Unverified, Incomplete

Related projects/activities:	
NASA informal initiative:	Lunar Sample/Meteorite
Category:	Resources (PD) for Educators
Location:	Multi-site
Duration:	N/A
Level (Project or Activity):	
Description:	This project is a series of professional development workshops for formal and informal educators on the use of the Lunar and Meteorite samples in the classroom. The goal is to increase understanding and awareness of the Moon and the NASA lunar missions. Training for teachers is held several times annually at the Goddard Visitor Center and across the GSFC Education region and is delivered by the ERC manager; AESP specialists and LRO mission EPO.
URL:	http://www.nasa.gov/centers/goddard/visitor/loan/lunar.html
Goals:	The goal of the Lunar and Meteorite Sample Loan Program is to provide access to NASA information in science and mathematics for teachers, students and curriculum support programs and to increase understanding and awareness of the Moon and the NASA lunar missions.
Year established:	
History (Congressionally Mandated or Discretionary):	
Products produced:	
Partner institution(s):	
Notes/additional info/data sources:	http://www.nasa.gov/centers/goddard/visitor/loan/
People Served	
Target audience:	K-12 educators, college instructors, museums and planetariums
Eligibility criteria:	Must be certified on the security requirements and proper handling procedures for the lunar samples (Certification Workshops offered periodically through NASA Goddard Space Flight Center)
Competitive process or open to general public:	
# people served per year	
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	Center - GSFC
Managing organization:	GSFC
Annual funding amount (by year):	2009 - $4,500
Per-participant cost (if available/applicable):	
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	
Evaluation status (In Progress or Complete) :	
Evaluator (Internal or External) :	
External evaluator name:	
Notes/additional info/data sources:	There is a link to a feedback form directly on the web site, found at http://www.nasa.gov/centers/goddard/visitor/loan/lunar.html. This link is currently broken (10/26).
Contact Information	
Contact information:	Jeanette Hilty, Jeanette.K.Hilty@nasa.gov
Notes/additional info/data sources:	
Status	No Response from Project Staff

Related projects/activities:	
NASA informal initiative:	LERCIP (Lewis Educational Research Collaborative Internship Project) High School
Category:	Resources/Opportunities for Students
Location:	OH
Duration:	8 weeks during summer
Level (Project or Activity):	
Description:	LERCIP High School is a paid summer internship opportunity for current high school sophomores and juniors who are permanent residents of Northeast Ohio and attend high school within a 50 mile radius of NASA Glenn Research Center. Students interested in careers in science, technology, engineering and math; professional administration and technical areas are engaged in an intensive internship experience while under the guidance of a Glenn scientist, engineer, technician or administrative professional who serves as the student's mentor. This center-unique project attracts previous participants in Glenn's center-unique educational opportunities and exposes students to NASA careers and hands-on NASA mission projects and activities, thus inspiring interest in STEM disciplines and NASA careers.
URL:	http://www.nasa.gov/centers/glenn/education/LERCIP_GRC.html
Goals:	• To attract and retain students in STEM disciplines through a progression of educational opportunities ; • To inspire a more diverse student population to pursue careers in STEM-related fields; • To expose students to possible career choices at NASA; and • To engage students with an intensive internship experience while under the guidance of a mentor.
Year established:	
History (Congressionally Mandated or Discretionary):	
Products produced:	
Partner institution(s):	
Notes/additional info/data sources:	
People Served	
Target audience:	High school students
Eligibility criteria:	US citizen; permanent resident of Northeast Ohio and attend high school w/in a 50 mile radius of NASA GRC; at least 16 years old; cumulative GPA of 3.0 (on a 4.0 scale)
Competitive process or open to general public:	Competitive
# people served per year	
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	GRC
Managing organization:	GRC
Annual funding amount (by year):	2009 - $225,000
Per-participant cost (if available/applicable):	
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Student surveys at end of program
Evaluation status (In Progress or Complete) :	On-going
Evaluator (Internal or External) :	Internal
External evaluator name:	N/A
Notes/additional info/data sources:	Student evaluations are completed at the end of the program via the Glenn Education Programs Office Intranet Site
Contact Information	
Contact information:	Darla Jones, darla.j.jones@nasa.gov, 216-433-2408
Notes/additional info/data sources:	
Status	No Response from Project Staff

Related projects/activities:	NASA Explorer Schools; NASA eClips
NASA informal initiative:	History of Winter
Category:	Resources (PD) for Educators
Location:	Lake Placid, NY
Duration:	One week
Level (Project or Activity):	
Description:	The History of Winter is a "teacher as scientist" cryosphere science-focused field experience for elementary and secondary science teachers. HOW utilizes an experiential learning opportunity for teachers to connect them firsthand to field research common to the cryosphere sciences and used as ground validation for NASA satellite missions. HOW models technology integration in the classroom and trains teachers in the use of these technologies.
URL:	http://education.gsfc.nasa.gov/how/ http://www.nasa.gov/centers/goddard/news/lake_placid_camp.html
Goals:	The ultimate goal of HOW is the improvement of the quality of science teaching
Year established:	2001
History (Congressionally Mandated or Discretionary):	
Products produced:	Distance-learning events, online multimedia resources, online community project site, Thermocron Mission, Global Snowflake Network
Partner institution(s):	EALAT, Buffalo Museum of Science, Go North! Polar Husky; Finnmark 2007, Northwood School, MU-SPIN (Minority University Space Interdidsciplinary Network), CASE, Blue Ice International, AIHEC-American Indian Higher Education Consortium, Andrill Offshore New Harbor Project, GLOBE, NASA GOST, NASA NEO/ICE, NASA SVS, NASA Tribal Colleges Program, NIA (National Institute of Aerospace), Nortel Learn-It Teach It, ORDA (Olympic Regional Development Authority), Springboard/Juneau Economic Development Council, SUNY-Buffalo, USA Speed Skating Association, USDA SEM Lab
Notes/additional info/data sources:	http://adsabs.harvard.edu/abs/2007AGUFMED21A0091G; http://www.spaceref.com/news/viewpr.html?pid=7439; http://www.nasa.gov/centers/goddard/news/lake_placid_camp.html
People Served	
Target audience:	Elementary and secondary science teachers
Eligibility criteria:	
Competitive process or open to general public:	Competitive
# people served per year	Approximately 150 people from 24 states since program inception (average of 19 people/year)
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	Center - GSFC
Managing organization:	GSFC
Annual funding amount (by year):	2009 - $30,000
Per-participant cost (if available/applicable):	
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Participant surveys
Evaluation status (In Progress or Complete) :	Finished
Evaluator (Internal or External) :	External
External evaluator name:	Center for Education Technology (CET) at Wheeling Jesuit University
Notes/additional info/data sources:	The HOW workshop was evaluated as part of the *NASA Explorer Schools Evaluation Brief 3, A Program in the Making: Findings from Year 1*
Contact Information	
Contact information:	Peter Wasilewski, peter.j.wasilewski@nasa.gov, 301-286-8317
Notes/additional info/data sources:	
Status	Verified, Incomplete

Related projects/activities:	
NASA informal initiative:	High School Intern Project
Category:	Resources/Opportunities for Students
Location:	Goddard Space Flight Center in Greenbelt, MD
Duration:	6 weeks over the summer in 2009; 8 weeks over the summer in previous years
Level (Project or Activity):	
Description:	HIP is a summer internship project for high school students. The project engages interns in 'real-time' STEM applications in a research-focused work environment at GSFC. HIP attracts and motivates rising seniors who have had a previous NASA intern experience, and/or who have local residence within the Baltimore and greater Washington DC metropolitan area for the six-week project duration. Students learn and apply research protocols and processes related to earth and space systems science, computer science, engineering, and technology.
URL:	http://education.gsfc.nasa.gov/files/HIPApplication08.pdf
Goals:	The purpose of this program is to engage students in 'real-time' applications of science, technology, engineering and math (STEM) in a research-focused work world.
Year established:	
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	Students complete research at GSFC and produce oral technical presentations.
Partner institution(s):	
Notes/additional info/data sources:	http://education.gsfc.nasa.gov/pages/placement.html
People Served	
Target audience:	High school students
Eligibility criteria:	US citizen; rising high school senior; 16 years old by program start; GPA equivalent of B or higher; available to participate five days per week for the duation of the program; have transportation to and from the GSFC. Students who just graduated may apply if they have completed a previous NASA internship and include a letter of recommendation from a mentor from that internship
Competitive process or open to general public:	Competitive
# people served per year	19 students in 2006
Notes/additional info/data sources:	NOTE: On different web sites there are different eligibility criteria (sophomore vs senior) and different durations, e. g. 6 weeks vs 8 weeks. The profile reflects FY2009 data, except where noted. http://education.gsfc.nasa.gov/files/HIPApplication08.pdf; http://university.gsfc.nasa.gov/p
Costs & Management	
Funding organization:	Center - GSFC
Managing organization:	GSFC
Annual funding amount (by year):	2009 - $60,000
Per-participant cost (if available/applicable):	
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	
Evaluation status (In Progress or Complete) :	
Evaluator (Internal or External) :	
External evaluator name:	
Notes/additional info/data sources:	
Contact Information	
Contact information:	Bonnie McClain, Education Specialist, Phone: 301-286-7356, Fax: 301-286-1655, Bonnie.McClain-1@nasa.gov
Notes/additional info/data sources:	
Status	No Response from Project Staff

Related projects/activities:	Space Explorer International: Fitness Challenge is the actual implementation of the FE Project content.
NASA informal initiative:	Fit Explorer
Category:	Resources/Opportunities for Students
Location:	Multi-site
Duration:	The FE Challenge can be implemented over a varible duration such as a single day event to multiple weeks to fully implement the challenge format of the project. The FE Project is a multi-year funded project from HRP and ESMD.
Level (Project or Activity):	Project. This is considered a project of the Human Research Program Education & Outreach Program, and it consist of activities and educational modules. This effort is still in the Phase 2 devleopment phase while we begin impleemtnation with the Phase 1 content to assess the design and content of the project
Description:	The Fit Explorer project is a physical and inquiry-based approach to learning about human health and fitness on Earth and in space. Students in grades 3-5 can participate in physical activities modeled after the real-life physical requirements of humans traveling in space. Students practice walking to their "base station," coordinating muscle movement for a space walk, jumping for strong bones, strength training for strong muscles, and developing post-mission improvements in balance.
URL:	http://humanresearch.jsc.nasa.gov/education/FitExp_main.asp
Goals:	The goals of the Fit Explorer project are: To increase the opportunity for students to be more physically active in and out of the classroom environment; to increase awareness about the importance of life-long health and fitness; to allow students to understand the relevance of being healthy and fit in pursuit of exploration; to help students grasp NASA's Vision for Space Exploration and the exciting future of long-duration space flight; to inspire and motivate the next generation of explorers to pursue careers in the STEM fields.
Year established:	October, 2006
History (Congressionally Mandated or Discretionary):	HRPEO worked with ESMD on potential ideas for new educational program, prepared and submitted a proposal and it was awarded.
Products produced:	Education Modules; Mission Handouts; Mission Journal Reflection; Mission Journal Instructions (for both student and teacher), now in both English and Spanish. Instrucational 1 minute videos available for the first set of activities.
Partner institution(s):	Wellness Initiative; President's Council on Physical Fitness and Sports; President's Challenge; National Space Biomedical Research Institute
Notes/additional info/data sources:	http://www.nasa.gov/audience/foreducators/fitexplorer/home; http://www.nasa.gov/audience/foreducators/fitexplorer/partners/index.html; http://www.nasa.gov/audience/foreducators/fitexplorer/partners/index.html
People Served	
Target audience:	Students, grades 3-5
Eligibility criteria:	N/A
Competitive process or open to general public:	Open
# people served per year	No specific number of people served per year. This is anticipated to grow as the implementation efforts really get underway starting in 2010. The SEI Fitness Challenge will involve 8 to 10 countries with approximately 10 to 15 leaders and about 100 children per country.
Notes/additional info/data sources:	The content will be tranlated into at least 10 languages. The basic languages for the project are English and Spanish.
Costs & Management	
Funding organization:	ESMD and Human Research Program
Managing organization:	JSC, HRPEO, SA2
Annual funding amount (by year):	FY2009 - $50,000 from ESMD and $200,000 from HRP (for both FE and SEI development)
Per-participant cost (if available/applicable):	N/A
Notes/additional info/data sources:	This project was started with a "Fast-Track" approach to meet the needs of the Agency for educational content to be highlighted on STS 118 (Launched August 2007). Afterwards HRPEO had significant changeover of personnel resulting in a significant slow down in the devleopment of the Phase 2 development efforts and little or no implementation assessment in the following year (Oct 2007- September 2008). The project picked up progress in October 2008 to present with new personnel in place, and the beginning of the development of the international Pilot challenge effort entitled Space Explorer International: Fitness Challenge, which is now schedule to happen sometime between April 2010 to April 2011 with eight to 10 supporting countries.
Evaluation	
Evaluation strategies:	N/A
Evaluation status (In Progress or Complete) :	In-process
Evaluator (Internal or External) :	Internal
External evaluator name:	N/A
Notes/additional info/data sources:	
Contact Information	
Contact information:	Charles W. Lloyd, Pharm.D. Program Manager, SA2 Human Research Program Education & Outreach (HRPEO) NASA, Johnson Space Center 2101 NASA Parkway Building 45, Room 248B Houston, Texas, 77058 USA 281-483-5361 Ofc 281-244-5334 Fax 281-685-2151 Mobile charles.w.lloyd@nasa.gov http://humanresearch.jsc.nasa.gov/education.asp
Notes/additional info/data sources:	
Status	Verified, Complete

Related projects/activities:	Fundamentals of Lunar Exploration (FLEX)
NASA informal initiative:	NASA's Beginning Engineering, Science, and Technology Students (BEST)
Category:	Resources/Opportunities for Educators & Students
Location:	Multi-site
Duration:	Variable
Level (Project or Activity):	
Description:	NASA's BEST(Beginning Engineering, Science, and Technology) provides primarily electronic but some face-to-face professional development for teachers and hands-on STEM curriculum support materials for teaching students in grades K-8. Users design, test, and analyze problems and challenges that are related to living and working on the moon. Each activity promotes teamwork, concept understanding, and project reflection while providing an opportunity for students to develop and apply problem solving and critical thinking skills.
URL:	http://userpages.umbc.edu/~hoban/BEST/
Goals:	To encourage students of all ages to engage in engineering and exploration activities.
Year established:	2008
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	Professional development for teachers. Hands-on STEM curriculum support materials for teaching students through activities including afterschool engineering clubs, 2-week summer bridges, STEM systems, expos and challenges.
Partner institution(s):	University of Maryland, Baltimore County
Notes/additional info/data sources:	http://userpages.umbc.edu/~hoban/BEST/presentations/HobanESMDFeb2009.pdf http://userpages.umbc.edu/~hoban/BEST/presentations/BEST2009+kickoff.pdf
People Served	
Target audience:	K-8 Teachers, students in K-12
Eligibility criteria:	N/A
Competitive process or open to general public:	Open to the public
# people served per year	Approximately 1,000
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	Mission-ESMD
Managing organization:	GSFC
Annual funding amount (by year):	$340,000 (FY09)
Per-participant cost (if available/applicable):	$340
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Outside evaluator
Evaluation status (In Progress or Complete) :	In process
Evaluator (Internal or External) :	External
External evaluator name:	Dr. Bob Wolffe, Bradley University
Notes/additional info/data sources:	Additional evaluation: Internal evaluation of ePD effectiveness, Laurie Cook http://userpages.umbc.edu/~hoban/BEST/presentations/HobanESMDFeb2009.pdf
Contact Information	
Contact information:	Dr. Susan Hoban (Project Coordinator) Susan.Hoban@nasa.gov, 301-286-7980
	Laurie Cook (Research, Electronic Professional Development), Lcook@umbc.edu
	Dr. Marci Delaney (Deputy) marci.delaney@nasa.gov, 301-286-7992
Notes/additional info/data sources:	http://userpages.umbc.edu/~hoban/BEST/presentations/HobanESMDFeb2009.pdf
Status	Verified, Incomplete

Related projects/activities:	Student Launch Initiative
NASA informal initiative:	Basics of Rocketry Workshops
Category:	Resources (PD) for Educators
Location:	held in Marshall's six state elementary/secondary and informal education service region of Alabama, Missouri, Tennessee, Arkansas, Iowa and Louisiana
Duration:	1 day
Level (Project or Activity):	
Description:	Basics of Rocketry Workshops are a series of at least six 1-day workshops for formal and informal educators of grades K-12. The workshops will demonstrate ways to integrate STEM activities in classroom curricula by developing science application knowledge and skills through inquiry and progressive practice. The workshops will be held in Marshall's six state elementary/secondary and informal education service region of Alabama, Missouri, Tennessee, Arkansas, Iowa and Louisiana. Experts in model rocketry from the local National Association of Rocketry (NAR) or Tripoli Rocketry Association and NASA education specialists will show participants how to build basic model rockets and learn about high-powered rockets, rocketry competitions, related NASA educator guides, NASA's future rocketry missions, and the importance of STEM disciplines in NASA's mission success.
URL:	http://www.nasa.gov/audience/foreducators/teachingfromspace/home/rocketry-workshops.html
Goals:	To give teachers a basic understanding of rocketry.
Year established:	2009
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	N/A
Partner institution(s):	LSU College of Education, National Association of Rocketry (NAR), Tripoli Rocketry Association
Notes/additional info/data sources:	http://www.lsu.com/UNV002.NSF/(NoteID)/7B69384DB207784E862575FD0068127A?OpenDocument
People Served	
Target audience:	formal and informal educators of grades K-12
Eligibility criteria:	N/A
Competitive process or open to general public:	Open
# people served per year	200 teachers as of October 2009
Notes/additional info/data sources:	One workshop in LA (July 22, 2009) hosted 37 preservice teachers. See: www.lsusystem.edu/news/?action=download&id=79
Costs & Management	
Funding organization:	Mission-ESMD
Managing organization:	MSFC
Annual funding amount (by year):	$43,000 FY09
Per-participant cost (if available/applicable):	N/A
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Teacher survey
Evaluation status (In Progress or Complete) :	Ongoing
Evaluator (Internal or External) :	N/A
External evaluator name:	N/A
Notes/additional info/data sources:	Survey questions are taken from the Office of Education Performance Management System (OEPM).
Contact Information	
Contact information:	Miranda Martin, Miranda.Martin@nasa.gov, 256-544-5812
Notes/additional info/data sources:	
Status	Verified, Incomplete

Related projects/activities:	Exploration Infusion
NASA informal initiative:	Astro Camp
Category:	Resources/Opportunities for Students
Location:	Stennis Space Center, MS
Duration:	weeklong summer camps and one-day Saturday camps during school year
Level (Project or Activity):	Project
Description:	Astro Camp is a series of weeklong summer camps, one-day Saturday camps, and special events for children ages 7 - 15 that inspire future astronauts and engineers to learn about space and STEM. Astro Camp presents math and science principles through fun, hands-on activities, teaching teams of campers to work together to complete missions. Astro Camp sessions inform children about manned space flight, NASA's Constellation program, the Space Shuttle, and Stennis propulsion testing.
URL:	http://education.ssc.nasa.gov/astrocamp.asp
Goals:	Inspire children to learn about space and STEM and inform them about manned space flight, NASA's Constellation program, the Space Shuttle, and Stennis propulsion testing
Year established:	project contact will check date
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	N/A
Partner institution(s):	Mississippi State University; a range of school districts in Mississippi
Notes/additional info/data sources:	According to the project contact, Astro Camps played a big role after Katrina and really reached out and traveled.
People Served	
Target audience:	Grades K-8
Eligibility criteria:	U.S. Citizens ages 7 to 15
Competitive process or open to general public:	Open to U.S. citizens, as space allows
# people served per year	"Numbers vary considerably across years and events. In 2008: -Saturday Camps: 8 camps w/224 students -Summer Camps: 11 camps w/400 students -Weekend interactions: 5 special events w/300 (Boy Scouts), X PRIZE Cup (80,000), Naval Construction Battalion Youth Center Family Appreciation Event (400), Smithsonian (1 million)"
Notes/additional info/data sources:	http://www.nasa.gov/offices/education/programs/descriptions/Astro_Camp.html (accessed 9/15/09)
Costs & Management	
Funding organization:	Mission-SOMD
Managing organization:	SSC
Annual funding amount (by year):	$200,000
Per-participant cost (if available/applicable):	N/A
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	evaluation strategy unknown
Evaluation status (In Progress or Complete) :	
Evaluator (Internal or External) :	
External evaluator name:	N/A
Notes/additional info/data sources:	
Contact Information	
Contact information:	Katie V. Wallace Elementary and Secondary Education Programs Officer, Office of External Affairs and Education NASA Stennis Space Center, Mail Code IA20 Stennis Space Center, MS 39529-6000 Phone: (228) 688-7744 E-mail: Katie.V.Wallace@nasa.gov
Notes/additional info/data sources:	
Status	Unverified, Incomplete

Related projects/activities:	Space Station Simulation (just released in October, 2009)
NASA informal initiative:	ARC Simulations and SpaceSmart
Category:	Resources Targeting the General Public
Location:	Multi-site
Duration:	N/A
Level:	Project (Product)
Description:	ARC Simulations and SpaceSmart is a software development for educational simulations and outreach. Viewers can experience the spacewalk to service the Hubble Space Telescope with this software. Viewers can download the software for free.
URL:	http://www.nasa.gov/audience/foreducators/spacesuits/home/index.html
Goals:	To educate and engage students and the general public about the work that NASA does in space, specifically relating to the Hubble Space Telescope and spacewalks.
Year established:	2008
History:	Discretionary
Products produced:	Simulation Software, Student Worksheet and Answer Key
Partner institution(s):	N/A
Notes/additional info/data sources:	
People Served	
Target audience:	Anyone with access to a computer utilizing a PC platform; written materials are targeted towards students in grades 5-8 and their teachers. Target audience for Hubble Space Telescope Simulation is middle school students.
Eligibility criteria:	N/A
Competitive process or open to general public:	Open
# people served per year	project contact can get number of hits and downloads
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	SOMD
Managing organization:	ARC
Annual funding amount (by year):	2009 - $204,800
Per-participant cost (if available/applicable):	N/A
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Testing was done by the developers with a sample group. Record of comments have been collected. SpaceSmart itself is an evaluation tool that collects attitudes. There is no data from SpaceSmart yet because it is in development.
Evaluation status:	Finished
Evaluator:	Internal
External evaluator name:	N/A
Notes/additional info/data sources:	
Contact Information	
Contact information:	Keith Shackelford, Phone: 650-604-2496, Fax: 650-604-0399, Keith.C.Shackelford@nasa.gov
Notes/additional info/data sources:	
Status	Unverified, Incomplete

Related projects/activities:	
NASA informal initiative:	Science on a Sphere Education Programs: Hurricanes, Cryosphere and Heliophysics Curriculum
Category:	Resources/Opportunities for Students
Location:	Goddard Space Flight Center (although other Science on a Sphere Programs exist outside of NASA)
Duration:	
Level (Project or Activity):	
Description:	Science on a Sphere Education Programs: Hurricanes, Cryosphere and Heliophysics Curriculum is a standards-based set of curriculum supplement materials delivered to fifth and eighth grade students visiting the GSFC Visitor Center. The project is center-funded and implemented by SMD EPO staff and Office of Education staff. It includes prework that must be completed prior to receiving the curriculum.
URL:	http://www.nasa.gov/centers/goddard/visitor/exhibits/sphere.html
Goals:	
Year established:	2005 (at GSFC, other Science on a Sphere programs existed previously)
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	"Footprints": a movie designed to be viewed on the sphere at GSFC
Partner institution(s):	National Oceanic and Atmospheric Administration (NOAA); Footprints will be shown at museums in Norfolk, VA., St. Paul, MN., Honolulu, HI., San Jose, CA., Baltimore, MD., Alpena, MI., Harrisonburg, VA., and Hilo, HI.
Notes/additional info/data sources:	http://www.oesd.noaa.gov/network/ISDE5_Paper_McDougall%20w_figs.pdf; http://www.nasa.gov/centers/goddard/visitor/exhibits/footprints.html
People Served	
Target audience:	5th and 8th grade students
Eligibility criteria:	N/A
Competitive process or open to general public:	Open
# people served per year	As of April 2007, Science on a Sphere was displayed by 17 institutions, with a cumulative total of 11 million visitors annually. It is unclear as to whether NASA is involved in the full scope of this. This data came from the NOAA.
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	Center - GSFC
Managing organization:	GSFC
Annual funding amount (by year):	2009 - $6,000
Per-participant cost (if available/applicable):	n/a
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Front-end evaluation
Evaluation status (In Progress or Complete) :	Finished (2004)
Evaluator (Internal or External) :	External
External evaluator name:	A. Apley from the RMC Research Corporation, prepared for the Maryland Science Center
Notes/additional info/data sources:	http://www.rmcportsmouth.com/Media%20and%20Museums NOTE: This evulation was for the general Science on a Sphere Program, as developed by the NOAA. Front-end and formative evaluations were also completed in 2006 by Amy Grack Nelson and Kirsten Ellenbogen for the Science on a Sphere program at the Science Museum of Minnesota: http://www.smm.org/static/researchandeval/sos-frontend0506.pdf; http://www.smm.org/static/researchandeval/sos-formative0706.pdf
Contact Information	
Contact information:	Trena Ferrel, Trena.M.Ferrell@nasa.gov
Notes/additional info/data sources:	Most of this information related to the overarching SOS program. No information was found specifically on "Hurricanes, Cryosphere and Heliophysics Curriculum".
Status	No Response from Project Staff

Related projects/activities:	Girl Scouts in the 21st Century proposal funded by ESMD; and a prospective study entitled, Rural Libraries Space, Science & Technology Exploration Project (RLSTEP), an informal science education Program grant 09-553.
NASA informal initiative:	21st Century Explorer
Category:	Resources/Opportunities for Students
Location:	Multi-site
Duration:	This is a content develop project which then has different approaches for implementation.
Level (Project or Activity):	Project
Description:	21st Century Explorer is a 3rd-5th grade curriculum supplement project that uses the Web, animation, and video to introduce standards-based science, technology, engineering, mathematics, and NASA space exploration concepts. Packages contain a 30-second newsbreak, an educator and student guide to hands-on activities, and an interactive web site featuring a web explanation of the exploration topic, glossary and quiz. Activity guides feature background information, science process skills, national education standards, materials list, step-by-step procedure for the activity, rubric and curriculum explorations.
URL:	http://education.jsc.nasa.gov/explorers/
Goals:	To inspire and motivate 3rd- to 5th- grade students, especially in underrepresented and underserved populations, toward interests in science, technology, engineering and mathematics.
Year established:	~ 2004
History (Congressionally Mandated or Discretionary):	This was a project proposal that was reviewed and funded by ESMD.
Products produced:	A series of activities and lesson plans; video clips; online Web explanation; hands-on activity guide; online glossary; quiz. All products are available in both English and Spanish.
Partner institution(s):	Univision - for distribution of video spots and to co-host community events
Notes/additional info/data sources:	
People Served	
Target audience:	Students, grades 3-5
Eligibility criteria:	N/A
Competitive process or open to general public:	Open
# people served per year	This is based on the supporting implementation efforts. Also track the 21c web site for downloads. On the average the 21c site has about 2,000 to 3,000 views per month.
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	ESMD
Managing organization:	JSC
Annual funding amount (by year):	2009 - $250,000
Per-participant cost (if available/applicable):	N/A
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	The new content development is designed by Educators on staff, reviewed and approved by Subject Matter Experts, reviewed and edited by project Editor, beta tested with qualitative assessment in the classroom (limited size) and submitted to NASA Education review. The initial short studies only compiled qualitative findings. The current prospective assessments such as the girl scouts and RLSTEP will have specific quantative instruments with the assistance of an External Evaluator.
Evaluation status (In Progress or Complete) :	In process
Evaluator (Internal or External) :	Internal for the development phase and external for the implementation phase
External evaluator name:	TBD
Notes/additional info/data sources:	
Contact Information	
Contact information:	Charles Lloyd, charles.w.lloyd@nasa.gov, 281-483-5361
Notes/additional info/data sources:	
Status	Verified, Complete

Related projects/activities:	
NASA informal initiative:	NEET/Exploration Station
Category:	Resources/Opportunities for Students
Location:	Kennedy Space Center
Duration:	year round, open for one hour visits M-F 9:00am-5:00pm and on the first and third Saturday of each month
Level (Project or Activity):	Project
Description:	The Kennedy Space Center NASA Exploration Station is a hands-on science activity learning facility located at NASA Kennedy Space Center for school groups and other student organizations. By emphasizing seeing, touching, and doing, the NASA Exploration Station provides effective learning opportunities in math, science, and technology. KSC manages the ERC through a Cooperative Agreement with UCF.
URL:	http://education.nasa.gov/edoffices/centeroffices/kennedy/erc/exstation.html
Goals:	To give local students an opportunity to participate in hands-on STEM learning activities.
Year established:	2006 (project contact will check this date)
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	N/A
Partner institution(s):	University of Central Florida
Notes/additional info/data sources:	http://education.ksc.nasa.gov/erc/exstation.htm
People Served	
Target audience:	School groups and other student organizations with access to the Kennedy Space Center
Eligibility criteria:	Group size must be between 15 and 45 students and have one adult per 10 students.
Competitive process or open to general public:	Open
# people served per year	In FY07: 4,826 educators participated in Exploration Station; 327 student groups with 18,328 students visited the Exploration Station and participated in hands-on NASA activiites.
Notes/additional info/data sources:	http://www.nasa.gov/pdf/230806main_2007_ESE_NEET.pdf
Costs & Management	
Funding organization:	Mission-SOMD
Managing organization:	KSC
Annual funding amount (by year):	FY09 - $160,000
Per-participant cost (if available/applicable):	per participant costs have not been calculated - have not instituted the PART measures as part of their requirement - contact does not have 09 participant #s and does not have 07 budget #s
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Teachers and students provide feedback forms. They don't use the PART system. OE does, but MDs have not been asked to phase-in w/the new system yet.
Evaluation status (In Progress or Complete) :	Ongoing
Evaluator (Internal or External) :	N/A
External evaluator name:	N/A
Notes/additional info/data sources:	
Contact Information	
Contact information:	Lesley Garner, Lesley.C.Garner@nasa.gov
Notes/additional info/data sources:	
Status	Unverified, Incomplete

Related projects/activities:	
NASA informal initiative:	NEET/Educator Resource Center
Category:	Resources (PD) for Educators
Location:	Kennedy Space Center
Duration:	year round, workshops take place for three hours on Saturdays
Level (Project or Activity):	
Description:	The KSC Educator Resource Center (ERC) is a source for a wide variety of educational materials, workshops, and other services for educators at all levels. The ERC is located at NASA Kennedy Space Center and serves educators in Florida, Georgia, Puerto Rico, and the Virgin Islands. KSC manages the ERC through a Cooperative Agreement with UCF.
URL:	http://education.nasa.gov/edoffices/centeroffices/kennedy/erc/ERC.html
Goals:	To provide assistance to STEM educators in Florida and the surrounding area.
Year established:	
History (Congressionally Mandated or Discretionary):	
Products produced:	
Partner institution(s):	University of Central Florida
Notes/additional info/data sources:	http://education.ksc.nasa.gov/erc/workshops.htm
People Served	
Target audience:	STEM educators with access to the Kennedy Space Center or UCF
Eligibility criteria:	None
Competitive process or open to general public:	Open
# people served per year	
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	Mission-SOMD
Managing organization:	KSC
Annual funding amount (by year):	FY09 - $160,000
Per-participant cost (if available/applicable):	
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	
Evaluation status (In Progress or Complete) :	
Evaluator (Internal or External) :	
External evaluator name:	
Notes/additional info/data sources:	
Contact Information	
Contact information:	Lesley Garner, Lesley.C.Garner@nasa.gov
Notes/additional info/data sources:	
Status	No Response from Project Staff

Related projects/activities:	
NASA informal initiative:	Exploring Project
Category:	Resources/Opportunities for Students
Location:	Cleveland, OH
Duration:	One weekday evening per week from October through April
Level (Project or Activity):	
Description:	Exploring is a career exploration project conducted by the Glenn Research Center in cooperation with the Boy Scouts of America for students aged 14 through 20. Activity groups led by NASA Glenn scientists and engineers meet one evening each week from October through April to work on group projects in the areas of Aeronautics, Computer Technology, Human Space Flight and Balloon Satellite Technology. The project exposes underrepresented and underserved students to various careers in STEM and allows them to experience hands-on activities that will inspire them to pursue STEM careers.
URL:	http://explorersposts.grc.nasa.gov/
Goals:	To provide young adults with a career exploration opportunity focused on engineering, computers, aeronautics and other STEM related areas.
Year established:	1965
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	
Partner institution(s):	Boy Scouts of America
Notes/additional info/data sources:	Exploring is part of Learning for Life's career education program. It is a larger project that is implemented across many sites. This description focuses on the Glenn Research Center site. http://www.nasa.gov/centers/glenn/education/NASAExplorers_GRC.html
People Served	
Target audience:	Students aged 14-20
Eligibility criteria:	US citizen; permanent resident of Northeast Ohio; 14 years old and have completed 8th grade by the program start date
Competitive process or open to general public:	Competitive
# people served per year	
Notes/additional info/data sources:	http://www.nasa.gov/centers/glenn/pdf/381231main_M-1799-2_new.pdf
Costs & Management	
Funding organization:	GRC
Managing organization:	GRC
Annual funding amount (by year):	2009 - $121,282
Per-participant cost (if available/applicable):	
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Internal Data Sources - Upcoming OEPM Evaluations
Evaluation status (In Progress or Complete) :	Complete for 2009
Evaluator (Internal or External) :	External
External evaluator name:	Louis Harris and Associates (this was a study not an evaluation and was of the whole Exploring Project, not just at GRC)
Notes/additional info/data sources:	http://www.learning-for-life.org/exploring/index.html (click on the "research" button)
Contact Information	
Contact information:	Stephanie Brown-Houston, SDBrown-houston@nasa.gov
Notes/additional info/data sources:	
Status	Verified, Incomplete

Related projects/activities:	The New Millenium Program
NASA informal initiative:	The Space Place
Category:	Resources/Opportunities for students
Location:	Multi-site (online)
Duration:	N/A-Web Project
Level:	Project
Program/Outcome:	Elementary/Secondary/eEducation (outcome 2)
Description:	The Space Place was started in February 1998 as an education and public outreach project of NASA's New Millennium Program, which continues to be its primary supporter. It includes a website in English and Spanish that targets elementary age children with appealing, content- rich STEM material on space science, Earth science, and technology. It wants to reach this young audience with the message that science and technology and learning about space are fun and within their grasp. It was designed with a kid-friendly "by kids, for kids" look and feel. It is modular, so visitors can pick and choose different standalone projects or activities that interest them at the moment. Challenging subjects such as the electromagnetic spectrum, conservation of momentum, orbits, gravitational waves, tidal forces, binary and hexadecimal notation, and interferometry are treated simply and concisely, with everyday analogies and metaphors, concrete examples, and compelling illustrations. It provides downloadable "Projects" activities, interactive games and demonstrations. The "Teacher's Corner" includes links to printable pictures for the classroom, a large collection of classroom activity articles previously published by the International Technology Education Association (ITEA), and downloadable and printable posters and other printed products. It also provides the Space Place Calendar, which includes space- and science-related anniversaries as well as whimsical "holidays," all linked to relevant activities and fun facts on the Website.
URL:	http://spaceplace.nasa.gov/en/kids/
Goals:	To convey to young children that science and technology and learning about space are fun and within their grasp.
Year established:	1998
Congressionally mandated or discretionary:	Discretionary
Products produced:	Web site (in both English and Spanish), which includes activities, animations and demonstrations, podcast, newsletter.
Partner institution(s):	Boys & Girls Club of America, YWCA of US, ITEA, 21st Century Community Learning, Civil Air Patrol, 4-H Aerospace Program, community museums, libraries, planetariums, zoos and aquariums across the country
Notes/additional info/data sources:	
People Served	
Target audience:	Elementary school age children
Eligibility criteria:	N/A
Competitive process or open to general public:	Open
# people served per year	14,000 people/day
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	SMD
Managing organization:	JPL
Annual funding amount (by year):	
Per-participant cost (if available/applicable):	N/A
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Interviews; surveys
Evaluation status:	Finished
Evaluator:	External
External evaluator name:	PERG
Notes/additional info/data sources:	http://nasascience.nasa.gov/educators/program-evaluation/Space%20Place%202006%20final.pdf
Contact Information	
Contact information:	Nancy Leon, nancy.j.leon@jpl.nasa.gov
Notes/additional info/data sources:	
Profile Status	No Response from Project Staff

Outcome 3 Profiles

Related projects/activities:	none
NASA informal initiative:	Community Outreach Programs in Education (COPE) - Informal
Category	Resources/Opportunities for Educators & Students
Location:	Multi-site
Duration:	Multiple durations
Level (Project or Activity):	Project
Description:	Community Outreach Programs in Education Elem-Sec (COPE Elem-Sec) is a response mechanism for the broad range of inquiries and requests for service from students and educators in grades K-12. Through COPE, KSC provides educational materials, educational services, as well as, coordination of local science fair judges and volunteer opportunities. KSC education staff receive inquiries via email, phone, regular mail, and personal contact and provide appropriate responses to the requesters needs. Funding for this effort is contained in KSC's "crosscutting costs" line item.
URL:	http://education.ksc.nasa.gov/programs/COPE.htm
Goals:	Connect NASA KSC with the local community, while introducing participants to the excitement of working in science, technology, engineering and mathematics for NASA.
Year established:	2005
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	Educational materials, educational services as well as coordination of local science fair judges and volunteer opportunities. Examples of informal national COPE education programs include Engineers Week, Space Day, Take Our Children to Work Day, and Sun Earth Day. Local COPE activities include Science Fairs and Career Days as well as support for community efforts such as Boy Scouts, Girl Scouts, Sally Ride Festivals and public engagements centered on KSC's support of specific NASA missions. Currently, COPE is involved in created an exhibit at Wannado City, a local children's play center and a NASA-themed deck of cards for a game called "You've been Sentenced".
Partner institution(s):	FIRST, Brevard County Schools, Governor's Schools (Florida Institute of Technology, Embry Riddle, and Florida State University)
Notes/additional info/data sources:	
People Served	
Target audience:	Students and educators K -12
Eligibility criteria:	none
Competitive process or open to general public:	all are open
# people served per year	Approximately 5,000
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	Center-KSC
Managing organization:	KSC
Annual funding amount (by year):	$0 (FY09), only money spent by KSC was on labor; other programs (e.g. FIRST Robotics) are funded by NASA's Science Mission Directorate; however, no funds are given to KSC Education Office for labor or procurement to manage FIRST.
Per-participant cost (if available/applicable):	$0
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	post-program surveys for many COPE programs
Evaluation status (In Progress or Complete) :	In Progress (yearly)
Evaluator (Internal or External) :	Internal
External evaluator name:	N/A
Notes/additional info/data sources:	
Contact Information	
Contact information:	Cheryl Johnson, 321-867-4602, Cheryl.m.johnson@nasa.gov
Notes/additional info/data sources:	
Status	Verified, Complete

Related projects/activities:	none
NASA informal initiative:	Museum Alliance
Category	Resources (PD) for Educators
Location:	Multi-Site, about 440 participating museums in 18 countries (about 400 in U.S.; about 40 internationally)
Duration:	On-Going
Level (Project or Activity):	Project
Description:	The Museum Alliance is a community of practice comprising informal science educators at museums, science centers, planetariums, observatory visitor centers, NASA visitor centers, zoos, aquariums, parks, and nature centers who wish to share NASA information with their visitors. Over 380 museums, science centers, planetariums and similar organizations of informal education are partners in the NASA Museum Alliance. These organizations regularly use NASA educational products, images, visualizations, video, and information in their educational and public programs and exhibits.
URL:	https://informal.jpl.nasa.gov/museum
Goals:	1) To develop a long-term, mutually beneficial working relationship between NASA and the museum community. 2) To enable museum professionals across the country to present current NASA science and technology to their education and public audiences by providing professional development opportunities, direct access to NASA experts, timely access to schedule information, and high-quality NASA materials including presentation materials, multimedia and printed materials
Year established:	2002 Mars Museum Visualization Alliance; in 2005 became Museum Alliance
History (Congressionally Mandated or Discretionary):	Discretionary: Initiated by JPL Institutional funds as well as direct funds; expanded with competively awarded NASA discretionary funds; continues with combination of JPL Institutional funds and NASA discretionary funds; singled out for OMB PART reporting
Products produced:	Website for museums including open access to presentations and related resources
Partner institution(s):	Professionals from about 440 museums, science centers, planetariums, NASA Visitor Centers, observatory visitor centers, nature centers, parks, zoos, aquariums and similar organizations in the U.S., U.K., Argentina, Australia, Brazil, Canada, Germany, Ireland, Japan, Malaysia, Mauritius, Mexico, Monaco, New Zealand, Nigeria, Spain, Sweden, and Turkey
Notes/additional info/data sources:	http://adsabs.harvard.edu/abs/2006DPS....38.4607S; http://trs-new.jpl.nasa.gov/dspace/bitstream/2014/41236/1/06-3402.pdf; https://informal.jpl.nasa.gov/museum/index.cfm?space=holder&&CFID=41683276&CFTOKEN=44096715
People Served	
Target audience:	Informal educators at museums, science centers, planetariums, observatory visitor centers, NASA visitor centers, zoos, aquariums, parks and nature centers who wish to share NASA information with their visitors.
Eligibility criteria:	Should be a staff member of an institution that is a legally organized public or private non-profit institution or part of a non-profit organization or government entity, is essentially educational in nature, use and interpret objects, images, and/or a site for the public presentation of regularly scheduled programs and exhibits, carries out the above functions primarily at a physical facility/site and has at least one paid or unpaid professional staff with museum knowledge and experience.
Competitive process or open to general public:	Open
# people served per year	Direct: about 700; Anonymous: millions
Notes/additional info/data sources:	https://informal.jpl.nasa.gov/museum/Joining/index.cfm
Costs & Management	
Funding organization:	JPL Education Office and NASA Informal Education
Managing organization:	JPL Informal Education
Annual funding amount (by year):	FY09 - $100K
Per-participant cost (if available/applicable):	
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Periodic needs assessments and formative evaluations; ongoing metrics collection
Evaluation status (In Progress or Complete) :	Needs assessment 2006; Formative evaluation via phone interviews 2006; Needs assessment update in progress 2009
Evaluator (Internal or External) :	External
External evaluator name:	Needs assessment: Rachel Connolly (formerly at AMNH and Columbia University, now at University of Louisville, KY; 2006 formative evaluation: Learning Innovations at WestEd - Research and Evaluation Group (Ann Brackett, Anthony Petrosino, and Sue Henderson
Notes/additional info/data sources:	http://trs-new.jpl.nasa.gov/dspace/bitstream/2014/41236/1/06-3402.pdf
Contact Information	
Contact information:	Anita Sohus, anita.m.sohus@jpl.nasa.gov
Notes/additional info/data sources:	
Status	Verified, Complete

Related projects/activities:	N/A
NASA informal initiative:	Lunar Nautics
Category	Resources/Opportunities for Students
Location:	Multi-site
Duration:	N/A
Level (Project or Activity):	Project (Product)
Description:	Lunar Nautics is a set of education materials that offers design challenges, team-building exercises, and an engaging, accessible CD for students in grades 5-8. The product includes an educator's guide, a student handbook, and an interactive CD. Informal and formal educators can use Lunar Nautics in a classroom, with an after-school group, or for a summer camp. Students are challenged to build bridges in microgravity, design a lunar habitat, assemble edible spacecraft, and compete to be crowned champion of "Survivor: Selene."
URL:	www.nasa.gov/education/lunarnautics
Goals:	To provide informal education support resources that use NASA, themes and content; to provide opportunities to improve the competency and qualifications of science technology, engineering, and mathematics (STEM) informal educators.
Year established:	2005
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	Lunar Nautics (Formal) Educators Guide; Lunar Nautics Student Employment Handbook; Lunar Nautics Toolkit; Lunar Nautics CD-ROM
Partner institution(s):	Discovery Place Museum
Notes/additional info/data sources:	http://www.nasa.gov/pdf/229720main_2007_IE_LN.pdf
People Served	
Target audience:	Students, grades 6-8
Eligibility criteria:	N/A
Competitive process or open to general public:	Open
# people served per year	N/A
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	ESMD
Managing organization:	MSFC
Annual funding amount (by year):	2009 - $15,000
Per-participant cost (if available/applicable):	N/A
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Educator reply card in back of the book
Evaluation status (In Progress or Complete) :	N/A
Evaluator (Internal or External) :	N/A
External evaluator name:	N/A
Notes/additional info/data sources:	
Contact Information	
Contact information:	Al Krause Education Specialist WILL Technology, Inc. NASA Marshall Space Flight Center, Huntsville, AL 35812 al.krause@nasa.gov 256-961-1354
Notes/additional info/data sources:	
Status	Unverified, Complete

Related projects/activities:	
NASA informal initiative:	Lunar Librarians Workshops
Category	Resources (PD) for Educators
Location:	Multi-Site
Duration:	2 days
Level (Project or Activity):	Project
Description:	This Project is a pedagogical training project for librarians and after-school providers. It is a continuation of a proposal originally funded by the HQ Office of Education under its NASA Explorer Institutes solicitation. It involves providing content related to the Lunar Reconnaissance Orbiter and human spaceflight. Participants use the material in after-school and summer educational projects. Using FY08 funding, thus $0 for FY09.
URL:	http://www.lpi.usra.edu/explore
Goals:	To create materials and provide training and support to librarians that enable them to engage their patrons in NASA's science and exploration, specifically children, youth, and families.
Year established:	2006
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	Lunar Librarians Newsletter; LRO module, Health and Space module, Beyond Earth module - each module has activities, background info, resources, etc.; online discussion group
Partner institution(s):	Johnson Space Center, Goddard, USRA, and a variety of state libraries
Notes/additional info/data sources:	
People Served	
Target audience:	Librarians and after-school providers
Eligibility criteria:	State libraries invite those serving underserved audiences
Competitive process or open to general public:	Open
# people served per year	Annual Estimate: 22,000 (project has served 368 librarians, who each then hold 3 workshops/year for approximately 20 children per workshop)
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	ESMD
Managing organization:	MSFC
Annual funding amount (by year):	2009 - $0 (should be $60,000 for 2009 per Project Staff)
Per-participant cost (if available/applicable):	FY 09 - trained 60 people, so $1,000 per participant
Notes/additional info/data sources:	Some SMD money has also been put into librarian workshops, but this profile covers only ESMD money
Evaluation	
Evaluation strategies:	Online surveys; telephone interviews
Evaluation status (In Progress or Complete) :	Finished
Evaluator (Internal or External) :	External
External evaluator name:	Erin Peters (worked w/Jerry for ESMD Education)
Notes/additional info/data sources:	
Contact Information	
Contact information:	Brian Mitchell, Brian.K.Mitchell-1@nasa.gov
	Stephanie Shipp, shipp@lpi.usra.edu
Notes/additional info/data sources:	
Status	Verified, Incomplete

Related projects/activities:	
NASA informal initiative:	K-12 Educator Workshop
Category	Resources (PD) for Educators
Location:	Multi-Site
Duration:	Sponsors programs and has available resources year round.
Level (Project or Activity):	
Description:	GSFC's K-12 Educator Workshop project is a series of informational programs for formal and informal educators and traveling scientists attending professional organizational meetings. During the workshops, participants are provided the opportunity to interact with various NASA scientists and EPO professionals, gain background knowledge on NASA missions, and collect NASA resources to excite their classrooms and visitors about NASA and STEM related topics and careers. This program is held twice a year.
URL:	http://www.astroed.org/
Goals:	To promote and develop excellence in astronomy education through professional development of formal and informal educators. To encourage exploration of connections between astronomy and other STEM disciplines.
Year established:	
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	INQUIRING ABOUT THE UNIVERSE, WHAT'S UP? - ACTIVITIES FOR TEACHING ASTRONOMY, ASTRONOMY DIAGNOSTIC TESTS
Partner institution(s):	Rochester Institute of Technology, University of Arizona, National Science Teachers Association (affiliate), Coalition for the Public Understanding of Science (member)
Notes/additional info/data sources:	http://www.facebook.com/pages/Association-for-Astronomy-Education/85856798285#/pages/Association-for-Astronomy-Education/85856798285?v=info NOTE: http://www.astroed.org was updated in October 2009. This profile reflects the most recent updates. This website, along with other sources, refers to the K-12 Educator Workshop as The Association for Astronomy Education.
People Served	
Target audience:	Formal and Informal Educators with strong interests in using astronomy to enrich learning in their classrooms or other settings
Eligibility criteria:	N/A
Competitive process or open to general public:	Open
# people served per year	
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	Center-GSFC
Managing organization:	GSFC
Annual funding amount (by year):	FY09 - $10,000
Per-participant cost (if available/applicable):	N/A
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	
Evaluation status (In Progress or Complete) :	
Evaluator (Internal or External) :	
External evaluator name:	
Notes/additional info/data sources:	
Contact Information	
Contact information:	Emilie Drobnes, Vice President, emilie.drobnes@nasa.gov, (301) 286-3146
	Dr. Jacob Noel-Storr, President, jake@cis.rit.edu; (585) 475-2521
	Aleya VanDoren. Secretary, aleya.vandoren@nasa.gov, (301) 286-0207
Notes/additional info/data sources:	
Status	No Response from Project Staff

Related projects/activities:	N/A
NASA informal initiative:	Girl Scouts Go NASA
Category	Resources/Opportunities for Students
Location:	Chattanooga, TN; Lafayette, LA; Ames, IA; Hunstville, AL; Birmingham, AL
Duration:	Full day - 8 hours
Level (Project or Activity):	Project
Description:	Girl Scouts Go NASA is a series of STEM-related learning events for Girl Scout Troops in Alabama. The events introduce girls to STEM career opportunities by involving them in For Inspiration and Recognition of Science and Technology (FIRST) LEGO League Robotics activities and other hands-on, STEM-based activities including design challenges from NASA's "On the Moon" educational guides.
URL:	N/A
Goals:	To encourage girls to go into STEM fields.
Year established:	2006??
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	N/A
Partner institution(s):	Girls Scouts
Notes/additional info/data sources:	
People Served	
Target audience:	Girl Scouts and Girls Scout leaders
Eligibility criteria:	Must be a girl scout or leader
Competitive process or open to general public:	Open to Girls Scout Troops in the regions in which MSFC works
# people served per year	460 (FY2009)
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	ESMD
Managing organization:	MSFC
Annual funding amount (by year):	2009 - $36,000
Per-participant cost (if available/applicable):	N/A
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	
Evaluation status (In Progress or Complete) :	
Evaluator (Internal or External) :	
External evaluator name:	
Notes/additional info/data sources:	Student and adult surveys and putting them in OEPM?
Contact Information	
Contact information:	Kristy Hill, kristy.hill@nasa.gov, 256-961-1358
Notes/additional info/data sources:	
Status	Verified, Incomplete

Related projects/activities:	Formal content to be converted to informal format is from the 21st Century Explorer Project (http://education.jsc.nasa.gov/explorers/index2.html)
NASA informal initiative:	Girl Scouts Exploring in the 21st Century
Category	Resources (PD) for Educators
Location:	Multi-site
Duration:	This implementation effort started in June 2009. Cohort 1 will be tested July 2010, followed by a Cohort 2 at another Girl Scout Council July 2011. This prospective study will end with a presentation at the 100th Anniversary of the Girl Scouts November 2011. Each Cohort involves GS Leaders (10) and girls (100). The testing period is a week long Summer Camp.
Level (Project or Activity):	It is a controlled prospective assessment of the utility of the 21st Century Explorer materials used in the informal setting.
Description:	Girl Scouts Exploring in the 21st Century is a series of STEM career informational workshops for Girl Scout Leaders across the country. Using educational materials produced and provided by NASA's Exploration Systems Mission directorate, participants train other leaders in their home regions to present materials to Scouts in order to encourage girls to pursue STEM-based careers.
URL:	NONE exist at this time. It is anticipated that we will modify the 21C site (http://education.jsc.nasa.gov/explorers/index2.html) to hold both the formal and informal formats.
Goals:	• RQ1: To what extent will the 21st Century Explorer project improve girl's interest in science, technology, engineering, and math? • RQ2: To what extent will 21st Century Explorer materials improve Girl Scouts knowledge and skills relating to science, technology, engineering and math? • RQ3: To what extent will participation in the 21st Century Explorer project increase Girls' knowledge related to the NASA STEM concepts addressed? • RQ4: How will 21st Century Explorer training enable Girl Scout leaders to deliver 21st Century Explorer materials in an informal science venue?
Year established:	2009
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	• 21st Century Explorer content suitable for implementation with Girl Scouts or other informal science venue. • Pre and post-qualitative and quantitative assessments with final analysis and reports. • eLearning system for information education content training. • At least two proposals submitted for publication.
Partner institution(s):	Girl Scouts - USA; the Iowa council; and one more council not yet selected
Notes/additional info/data sources:	
People Served	
Target audience:	Girl Scout Leaders and the influence it has on young girls' interest and knowledge of space exploration.
Eligibility criteria:	These are approved Girl Scout Trainers and Leaders, and the girls must be in either 4th or 5th grade.
Competitive process or open to general public:	The cohorts are jointly selected by HRPEO and GSUSA.
# people served per year	Each Cohort will have approximately 10 to 15 leaders or trainers and about 100 girls. There will be two cohorts.
Notes/additional info/data sources:	The ESMD Proposal is available if desired.
Costs & Management	
Funding organization:	ESMD
Managing organization:	JSC
Annual funding amount (by year):	2009 - $200,000; 2010 - $203,000; 2011 - $200,00
Per-participant cost (if available/applicable):	N/A
Notes/additional info/data sources:	The breakout budget is available if desired.
Evaluation	
Evaluation strategies:	Instruments needed for evaluation of the educational materials will be constructed and reviewed by TBD External Evaluator and the 21st Century Explorer project team. These will be used primarily for evaluation of program outcomes associated with participant populations. The following is a list of instruments needed to complete the evaluation process: • Leader Outcome Test – This measure examines the knowledge and skills associated with project delivery. • Interest Inventory – This measure will follow the student in terms of participation and completion of project materials. • STEM Related Knowledge and Skills Test – This instrument will examine student gain in knowledge related to STEM concepts and changes in interest or attitude associated with STEM topics and careers. • Fidelity and Adaptation Survey – This measures examines the implementation process of the Leaders to ascertain the degree of fidelity associated with program implementation and changes that were generated and included by the Leader
Evaluation status (In Progress or Complete) :	Not yet started
Evaluator (Internal or External) :	External
External evaluator name:	TBD
Notes/additional info/data sources:	
Contact Information	
Contact information:	Charles Lloyd, charles.w.lloyd@nasa.gov, 281-483-5361
Notes/additional info/data sources:	
Status	Verified, Incomplete

Related projects/activities:	NASA After School Astronomy Clubs (http://afterschoolastronomy.org)
NASA informal initiative:	Girl Scout Leader Training
Category	Resources (PD) for Educators
Location:	Multi-Site
Duration:	The duration of the whole project is 2 years.
Level (Project or Activity):	Project
Description:	Girl Scout Leader Training is a professional development program for Girl Scout leaders, using master Girl Scout trainers, amateur astronomers, Girl Scout council leaders, and senior Girl Scouts as a supportive team. NASA and the Girl Scouts of the USA are partners in a groundbreaking effort to inspire young women to pursue careers in science, technology and mathematics. We provide education materials and training to Girl Scout leaders, who help NASA fulfill its mission to "inspire the next generation of explorers." This project focuses on broad-based astronomy education. NASA is working with the TIE (Telescopes in Education) Foundation to develop a robotic telescope in Portal, AZ. This Girl Scout Robotic Telescope is to be used exclusively by Girl Scout Astronomy Clubs.
URL:	There is mention of this project on the NASA After School Astronomy Clubs web site (http://afterschoolastronomy.org) - the project will eventually have it's own web site
Goals:	To help NASA inspire girls to pursue astronomy-related careers.
Year established:	2009
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	Training Program; Robotic Telescope; there will also be a web site
Partner institution(s):	Girl Scouts USA; Telescopes in Education (TIE) Foundation
Notes/additional info/data sources:	
People Served	
Target audience:	Girl Scout leaders
Eligibility criteria:	Must be a Girl Scout leader, although NASA provides similar training to other education professionals
Competitive process or open to general public:	Open (for Girl Scout leaders only)
# people served per year	The estimated final impact is 10,000 people. Original participants are approximately 100 people from 20 different Girl Scout council teams. These people will begin Girl Scout Astronomy Clubs and train others to do the same.
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	Center-GSFC
Managing organization:	GSFC
Annual funding amount (by year):	FY09 - $10,000 - should be about $200,000/yr per Lou Mayo
Per-participant cost (if available/applicable):	N/A
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	
Evaluation status (In Progress or Complete) :	In-process
Evaluator (Internal or External) :	External
External evaluator name:	Girl Scouts USA
Notes/additional info/data sources:	
Contact Information	
Contact information:	Lou Mayo, Louis.A.Mayo@nasa.gov
Notes/additional info/data sources:	
Status	Unverified, Incomplete

Related projects/activities:	N/A
NASA informal initiative:	Field Trip to the Moon
Category	Resources/Opportunities for Students
Location:	Multi-site
Duration:	N/A
Level (Project or Activity):	Project (Product)
Description:	Field Trip to the Moon is a set of STEM teaching materials for formal and informal educators and students in grades 5-8. A DVD media presentation featuring a rocket launch to the Moon is supported by a wealth of inquiry-based and team-centered activities. Six thematic toolkits – geology, ecosystem, navigation, engineering, medical, and habitat – are included.
URL:	http://www.nasa.gov/education/ftm; http://www.nasa.gov/education/ftmlrolcross.
Goals:	To provide informal education support resources that use NASA, themes and content; to provide opportunities to improve the competency and qualifications of science technology, engineering, and mathematics (STEM) informal educators.
Year established:	2005
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	Field Trip to the Moon Formal Educator's Guide, Field Trip to the Moon Informal Educator's Guide, Field Trip to the Moon Companion Guide, Field Trip to the Moon DVD, Field Trip to the Moon Dome version presentation, Field Trip to the Moon Toolbox Kits
Partner institution(s):	American Museum of Natural History
Notes/additional info/data sources:	
People Served	
Target audience:	Students in grades 5-8
Eligibility criteria:	N/A
Competitive process or open to general public:	Open
# people served per year	Total number of people reached as of March 6, 2008: 5,610
Notes/additional info/data sources:	http://www.nasa.gov/pdf/229719main_2007_IE_FTM.pdf
Costs & Management	
Funding organization:	ESMD
Managing organization:	MSFD
Annual funding amount (by year):	2009 - $15,000
Per-participant cost (if available/applicable):	N/A
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Educator reply card in back of the book
Evaluation status (In Progress or Complete) :	N/A
Evaluator (Internal or External) :	N/A
External evaluator name:	N/A
Notes/additional info/data sources:	
Contact Information	
Contact information:	Al Krause Education Specialist WILL Technology, Inc. NASA Marshall Space Flight Center, Huntsville, AL 35812 al.krause@nasa.gov 256-961-1354
Notes/additional info/data sources:	
Status	Verified, Complete

Related projects/activities:	
NASA informal initiative:	Citizens And Remote Sensing Observational Network (CARSON) Project
Category	Resources Targeting the General Public
Location:	Multi-Site
Duration:	N/A
Level (Project or Activity):	Project
Description:	The Carson Project is a set of online Earth observation science guides and training modules for citizen scientists; informal educators, and science centers. The objective is to help citizen scientists access NASA Earth System Science data, and provide procedures for making ground-based observations to facilitate the connection between local environmental issues and Earth System science. Training sessions are held at the Maryland Science Center.
URL:	http://adsabs.harvard.edu/abs/2008AGUFMED31A0594A
Goals:	To help citizen scientists access NASA Earth System Science data, and provide procedures for making ground-based observations to facilitate the connection between local environmental issues and Earth System science.
Year established:	2008
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	Volksdata: a tool where anyone can share scientific data and analyze it online
Partner institution(s):	Harvard Universiy, TERC, National Oceanic and Atmospheric Administration, Maryland Science Center, Society for Amateur Scientists
Notes/additional info/data sources:	http://www.facebook.com/group.php?gid=82878658281; http://www.marylandsciencecenter.org/exhibits/Carson.html; http://www.volksdata.com
People Served	
Target audience:	Non-science professionals interested in conducting science research
Eligibility criteria:	None
Competitive process or open to general public:	Open
# people served per year	
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	Center-GSFC
Managing organization:	GSFC
Annual funding amount (by year):	FY09 - $60,000
Per-participant cost (if available/applicable):	
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	
Evaluation status (In Progress or Complete) :	
Evaluator (Internal or External) :	
External evaluator name:	
Notes/additional info/data sources:	
Contact Information	
Contact information:	Holli Riebeek, Holli.Riebeek@nasa.gov
Notes/additional info/data sources:	
Status	No Response from Project Staff

Related projects/activities:	NASA Explorer Institutes
NASA informal initiative:	CP4SMP - Science Museums and Planetarium Grants
Category	Resources (PD) for Educators
Location:	Multi-site
Duration:	N/A
Level (Project or Activity):	Project
Description:	The Competitive Program for Science Museums and Planetariums (CP4SMP) is a grant or cooperative agreement opportunity for institutions of informal education. The project supports NASA-themed science, technology, engineering or mathematics informal education, including exhibits, within these Congressionally directed topics: space exploration, aeronautics, space science, Earth science or microgravity.
URL:	http://nspires.nasaprs.com/external/viewrepositorydocument/cmdocumentid=152816/CP4SMP%20Solicitation%20%207-18.pdf
Goals:	Build strategic partnerships and linkages between STEM formal and informal education providers that promote STEM literacy and awareness of NASA's mission.
Year established:	2008
History (Congressionally Mandated or Discretionary):	Congressionally mandated
Products produced:	Not yet available first grants made Summer 2009
Partner institution(s):	Participating organizations include museums, planetariums, Challenger Centers, aquariums, and other institutions of informal education.
Notes/additional info/data sources:	http://www.nasa.gov/audience/foreducators/informal/mus-planetariums-index.html
People Served	
Target audience:	Institutions of informal education
Eligibility criteria:	Institutions of informal science, technology, engineering and mathematics (STEM) education that are science museums or planetariums in the United States or its Territories
Competitive process or open to general public:	Competitive
# people served per year	Not yet available; first grants made Summer 2009
Notes/additional info/data sources:	http://nspires.nasaprs.com/external/solicitations/summary.do?method=init&solId={ABA44634-8D41-50FA-6BF3-9D9EA3D4D792}&path=open
Costs & Management	
Funding organization:	HQ - Informal
Managing organization:	JPL (peer reivew process) NASA Centers grant management
Annual funding amount (by year):	2009 - $7,000,000
Per-participant cost (if available/applicable):	Thirteen informal education providers were funded in 2009 to share 6.9 million (grant sizes range from $100,00-$900,000).
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Funded grants have evalaution plans
Evaluation status (In Progress or Complete) :	Annual Grant-Level Reports to NASA
Evaluator (Internal or External) :	Internal
External evaluator name:	
Notes/additional info/data sources:	
Contact Information	
Contact information:	Anita Sohus, anita.m.sohus@jpl.nasa.gov
Notes/additional info/data sources:	
Status	Verified, Complete

Related projects/activities:	CP4SMP
NASA informal initiative:	NASA Explorer Institutes
Category	Resources (PD) for Educators
Location:	Multi-site
Duration:	N/A
Level (Project or Activity):	Project
Description:	NASA Explorer Institutes(NEI), the priority project of the Informal Education Program was to provide engaging experiences, opportunities, materials and information to members of the informal education community including, but not limited to, representatives of science centers, museums, planetariums, libraries, parks, aquaria, nature centers, botanical gardens, youth groups and community-based organizations. It provided competitive grants for projects that collectively targeted large segments of the informal education community and extended across the country. The Informal Education Project focused on NASA Explorer Institutes (NEI), its priority initiative. Four categories of NEI projects were considered for funding in FY 2009 including: Professional Development Workshops; STEM Learning Tools and Products; Infrastructure Development; and Partnerships for Sustainability. In 2010, NEI will be replaced by NASA Informal Education Opportunities (NIEO).
URL:	http://education.nasa.gov/divisions/informal/overview/F_pathfinder_explorer_institute.html
Goals:	(1) Improve the public's understanding and appreciation of science, technology, engineering and mathematics (also known as STEM) disciplines to enhance their scientific and technological literacy, mathematical competence, problem-solving skills and the desire to learn. (2) • Establish linkages that promote new relationships between providers of informal and formal education resulting in improved and creative STEM education in all learning environments. (3) • Excite youth, particularly those who are underrepresented and underserved, about STEM disciplines. (4) • Expand STEM informal education programs and activities to communities/locations that have been traditionally underserved by such opportunities. (5) • Stimulate parents and others to support their children's learning endeavors in formal and informal settings and to become informed proponents for high-quality, universally available STEM education in the home and elsewhere. (6) • Encourage and implement innovative strategies that support the development of a socially responsible and informed public who can make responsible decisions about STEM policy issues affecting their everyday lives.
Year established:	2004
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	STEM teaching tools and products
Partner institution(s):	552 individual FY04 NEI participants (representing 314 institutions) contributed to workshops and focus groups in next steps report.
Notes/additional info/data sources:	
People Served	
Target audience:	Informal educators
Eligibility criteria:	The NEI projects target large segments of the informal education community and extend across the country. The proposed content engages the American public in Earth and space science, lunar exploration, and/or space operations topics. The projects cover: (1) Professional Development Workshop Opportunities; (2) Science, Technology, Engineering and MathematicsTeaching Tools and Products; (3) Infrastructure Development Projects; (4) Partnerships for Sustainability.
Competitive process or open to general public:	Competitive
# people served per year	
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	Office of Education
Managing organization:	Integration Education Division
Annual funding amount (by year):	2009 - $0
Per-participant cost (if available/applicable):	N/A
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Focus groups, workshops, evaluation meeting
Evaluation status (In Progress or Complete) :	Historical project
Evaluator (Internal or External) :	Internal
External evaluator name:	N/A
Notes/additional info/data sources:	http://education.nasa.gov/divisions/informal/overview/F_Explorer_Institutes_Report.html; http://www.transitofvenus.org/focusgroup/final.htm
Contact Information	
Contact information:	Mary Sladek
	Jim Stofan
Notes/additional info/data sources:	
Status	Verified, Incomplete

Related projects/activities:	
NASA informal initiative:	How Things Fly (HTF)
Category	Resources Targeting the General Public
Location:	National Air and Space Museum, Washington, DC
Duration:	N/A
Level (Project or Activity):	Project
Description:	In an effort to expand the awareness of the visiting public about the physics of flight and the development - past, present, and future- of air and space technologies, NASA is providing in-kind and financial support to the Smithosonian's facelift of the How Things Fly (HTF) Exhibition at the Air and Space Museum. The exhibition, the museum's most popular, explains how aircraft and spacecraft fly. This project began in FY 2008 and will continue for five years. The refurbished HTF gallery will provide a safer, more pleasant environment for visitors through 2016, but the content themes of the exhbition will remain unchanged. New interactive devices will be added to augment the concepts already present, and some will replaces devices that have proven to be difficult to use or understand. The Resource Center will be redesigned to attract and accommodate a larger percentage of visitors through short, hands-on, staff-led activities.
URL:	http://www.nasm.si.edu/exhibitions/GAL109/
Goals:	To expand the awareness of the visiting public about the physics of flight and the development - past, present, and future- of air and space technologies.
Year established:	2008
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	Forces of Flight interactive Web site; How Things Fly teaching poster and activities for grades 5-8; How Things Fly: The Science of Flight professional development opportunity for teachers of grades 6-10
Partner institution(s):	Smithsonian Institution; National Air and Space Museum
Notes/additional info/data sources:	http://www.nasm.si.edu/exhibitions/gal109/htf/activities/forcesofflight/web; http://www.nasm.si.edu/education/pubs/howthingsfly.pdf
People Served	
Target audience:	General Public
Eligibility criteria:	N/A
Competitive process or open to general public:	Open
# people served per year	
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	Office of Education
Managing organization:	Informal Education Program
Annual funding amount (by year):	2009 - $140,000
Per-participant cost (if available/applicable):	
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	
Evaluation status (In Progress or Complete) :	Finished
Evaluator (Internal or External) :	External
External evaluator name:	Science Learning Incorporated
Notes/additional info/data sources:	Anderson, D., Hilke, D. D., Kramer, R., Abrahams, C. B., & Dierking, L. D. (1997). Summative evaluation research: How things fly—National Air and Space Museum. Unpublished evaluation report. Annapolis, MD: Science Learning Incorporated.
Contact Information	
Contact information:	Mary Sladek, mary.f.sladek@nasa.gov
Notes/additional info/data sources:	
Status	Verified, Incomplete

Related projects/activities:	Earth and Space Science - Informal Education Opportunities (IEO)
NASA informal initiative:	SMD EPOESS (Earth and Space Science - Building Informal Educator Skills (ESS-BIES) and Informal Education Resources (IER))
Category	Resources (PD) for Educators
Location:	Multi-Site
Duration:	3-4 year grants
Level (Project or Activity):	Project (grant opportunities)
Description:	Building Informal Educator Skills is an SMD project that provides training for informal educators on SMD informal education resources. The purpose of the project is to deepen their understanding of SMD science and technology so they can more effectively convey information to their audiences. The project is carried out through SMD missions and competitively selected awardees working in partnership with informal education institutions AND Informal Education Resources is an SMD project that develops and disseminates resources for infomal education. The purpose of the project is to make SMD science and technology discoveries available in informal education venues such as science centers and planetariums. The project is carried out through SMD missions and competitively selected awardees working in partnership with informal education institutions.
URL:	N/A
Goals:	The purpose of the project is to deepen informal educators' understanding of SMD science and technology so they can more effectively convey information to their audiences AND to make SMD science and technology discoveries available in informal education venues through dissemination of resources.
Year established:	2006
History (Congressionally Mandated or Discretionary):	Discretionary
Products produced:	Resources for informal educators (IER)
Partner institution(s):	Grantees from: Space Telescope Science Institute, UNH, Harvard, Space Science Institute, Science Systems and Applications, Inc., Astronomical Society of the Pacific Sky Rangers, JPL
Notes/additional info/data sources:	
People Served	
Target audience:	Informal educators
Eligibility criteria:	Grant proposal criteria for evaluation: 1) intrinsic merit, 2) relevance to NASA objectives, 3) reasonable cost, 4) content balance/diversity
Competitive process or open to general public:	Competitive
# people served per year	
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	SMD
Managing organization:	SMD
Annual funding amount (by year):	$901,631 (first two years of awards for outcome 3 grants)
Per-participant cost (if available/applicable):	There are seven EPOESS recipients (eight grants) over first two years of award in Outcome 3/$901,631
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Formal/informal surveys, interviews, website review, document review, conferences, workshops, trainings and observations
Evaluation status (In Progress or Complete) :	Complete
Evaluator (Internal or External) :	External
External evaluator name:	PERG
Notes/additional info/data sources:	http://nasascience.nasa.gov/educators/program-evaluation/NASA%202007%20Summative%20report.pdf
Contact Information	
Contact information:	Stephanie Stockman, stockman@core2.gsfc.nasa.gov
Notes/additional info/data sources:	
Status	Unverified, Incomplete

Related projects/activities:	N/A
NASA informal initiative:	NASA Visitor Centers
Category	Resources Targeting the General Public
Location:	Multi-Site; locations at 12 NASA Centers and Facilities
Duration:	Year round
Level (Project or Activity):	Project
Description:	The NASA Visitor Centers Project allocates funds to each of the NASA field centers. The project enables the Visitor Centers to develop NASA STEM education activities, including exhibits, events and materials that address one or more of the NASA Education Outcomes and align with NASA education principles, and state or national standards/needs.
URL:	http://www.nasa.gov/about/visiting/
Goals:	To develop educational activities in science, technology, engineering, and mathematics (STEM), and to the extent possible, address educational needs of women, minorities, and other historically underrepresented groups.
Year established:	2008
History (Congressionally Mandated or Discretionary):	Congressionally mandated
Products produced:	Center-specific
Partner institution(s):	NASA Headquarters, Ames Research Center, Dryden Flight Research Center, Glenn Research Center, Goddard Space Flight Center, Jet Propulsion Laboratory, Johnson Space Center, Kennedy Space Center, Langely Research Center, Marshall Space Flight Center, Stennis Space Center, Wallops Flight Facility
Notes/additional info/data sources:	
People Served	
Target audience:	General Public
Eligibility criteria:	None
Competitive process or open to general public:	Open
# people served per year	
Notes/additional info/data sources:	
Costs & Management	
Funding organization:	HQ-Informal
Managing organization:	HQ-Office of Ed
Annual funding amount (by year):	FY 2009 - $7,000,000
Per-participant cost (if available/applicable):	N/A
Notes/additional info/data sources:	
Evaluation	
Evaluation strategies:	Descriptive quarterly reports including: 1) major staff and partners involved; 2) products developed or anticipated; 3) activities undertaken; 4) activities planned for next quarter; 5) problems encountered; and 6) budget spent to date by category.
Evaluation status (In Progress or Complete) :	In progress
Evaluator (Internal or External) :	Internal
External evaluator name:	N/A
Notes/additional info/data sources:	
Contact Information	
Contact information:	1 Mary Sladek, mary.f.sladek@nasa.gov
	2 Ames:Wendy Holforty (650-604-5648)
	3Dryden:Cecelia Cordova (661-276-3266)
	4 Goddard: Keith Koehler (757-824-1579)
	5 Glenn: Stephanie Brown (216-433-8006)
	6 JPL: Anita Sohus (818-354-6613)
	7 Johnson: Allison Benjamin & Susan Anderson (281-483-8630)
	8 Kennedy: Lesley Garner (321-867-3623)
	9 Langley: Roger Hathaway (757-864-3312)
	10 Marshall: Tammy Rowan (256-961-0954)
	11 Stennis: Cheri Miller (228-688-3802)
Notes/additional info/data sources:	
Status	Unverified, Incomplete

Appendix B

Data Collection Protocols

NASA Informal Education Evaluation
Data Collection Guide

The objective of the evaluation is to determine the status of NASA projects relative to the five outcomes of interest, as well as provide a detailed description of each project and its particular context. In addition to providing the information necessary to understand each project's status, the project description and contextual information will also inform the analysis of project outcomes. This is particularly true with regard to sustainability.

During the course of the evaluation, we will collect data from document reviews and interviews with key individuals that will enable us to systematically document and describe each project and its status relative to each of the five outcomes. This data collection guide is intended to provide a comprehensive and detailed overview of the nature and extent of the information we will collect relative to each outcome. We will collect as much project data as possible using document reviews, prior to interviews, to reduce the amount of time required of project staff and their partners. To the extent possible, we will collect a complete set of data for each project.

1. Project description

- Project goals
  - What are project goals (outcomes)
  - How are project impacts tracked
  - What are the reporting requirements
  - What are the review and oversight processes
- Project activities
  - What activities/experiences are made available to participants
  - Who are the target audiences
- Project materials/equipment
  - What materials/equipment are required/used by the project
  - What materials/equipment are created by the project
  - What organization(s) created/contributed to project equipment/materials
  - How are materials/equipment maintained
- Space
  - Where do project activities occur
  - What and how much space is required
  - Who is responsible for making space available
- Staff
  - Number and qualifications
  - Training/professional development required
  - Stability/turnover
- Project leadership
  - Number and responsibilities of project leaders
  - Where are leaders located geographically/hierarchically
  - Training/professional development required for leaders
  - Stability of project leaders
- Finances
  - Total annual budget
  - Sources of funding
  - Stability of funding

  - Funders' requirements/obligations
  - Process for raising funds
  - Sufficiency and/or insufficiency of funding
- Project implementation
  - Trends in implementation (e.g., changes over time)
  - Challenges/barriers for project implementation
  - Successes of project implementation
  - What would/should have been done differently
- Culture/context
  - Individual versus collective
  - Hierarchical versus flat
  - Entrepreneurial versus stable
  - Communication
  - Bureaucratic versus informal
  - Centralized versus decentralized

2. Reach into the community

- People directly affected
  - # people with contact time/time period
  - Average duration of contact
  - # of contact experiences/time period
  - Geographic distribution of people w/contact time
- People indirectly affected
  - Who are they
  - How many
  - In what ways are they affected
- Other impacts (e.g., on communities, institutions, relationships, etc?)
- Perception of the project
  - How well is the project known
  - How is the project regarded
  - How helpful is the perception

3. Partnerships

For each partner:

- Role
  - Responsibilities of partner organization
  - Nature and extent of integration with NASA (e.g., is the work of the partner independent of NASA, or is there any inter-dependency? If so, to what extent?)
  - # and roles of people involved
  - Time, money, materials, other resources required by the partner
  - Training and preparation required by partner staff
  - Feasibility of another organization taking on this role
- Internal partner support
  - Relative importance of this project to partner's overall mission
  - Internal support for partner's role
  - Benefits/costs of involvement to partner
  - How might the value of this partnership change over time
- Relationship

  - Duration of relationship
  - Who is involved in managing and sustaining the partnership
  - Stability of relationship
  - Time, effort, financial costs, other resources required to sustain the partnership
- Products
  - Tangible products of the partnership
  - Intangible products of the partnership

When there are multiple partners, we would create a profile for each one, and then synthesize findings across partners.

4. Planned and unplanned outcomes

- Planned outcomes
  - To what extent is the project achieving its goals
  - What factors explain the project's level of success
  - How, if at all, would you like to see the project's performance change in the future
- Unplanned outcomes
  - Are there any unplanned outcomes
  - What explains them
  - What opportunities or lessons learned do they offer
  - In what ways, if at all, will they inform the project's future development
  - How important are they to NASA's informal mission
  - How important are they to partners' missions

5. Use of NASA resources

- NASA resources (e.g., money, materials, other products, equipment, ideas, expertise, space, identity/logo
  - How are NASA resources used
  - Relative importance of NASA resources compared to others used by the project
  - What evidence is there that the project is augmenting/enhancing NASA resources

6. Sustainability

Project sustainability will be evaluated based on a composite of factors collected from the project context and outcomes specified above. The following features (from above) will be considered in describing project sustainability:

- Funding (sources & stability)
- Partnerships (longevity & stability)
- Leadership (effectiveness, stability, training)
- Products/activities (degree of desirability, level of use)
- Perception (positive/negative, entrenchment in community)
- Critical mass (sufficient interest)

CP4SMP Focus Group Questionnaire

Your input is important to help us understand the work of the projects selected for the Evaluation. As part of the focus group we are asking you to fill out a brief questionnaire about your CP4SMP-funded project. We understand that each project is in a different phase of start-up or implementation—please answer the questions to the best of your ability. Please keep in mind that: 1) Your participation is entirely voluntary—you can choose to discontinue participation at any point or answer some questions and not others; 2) No individuals will be identified by name however we cannot assure confidentiality because job titles may be used in our Evaluation report to NASA. When you are finished with your questionnaire, please return it to your focus group facilitator

Thank you!

Project Description

1. Project Name:

2. Are you the principal investigator?
   a. Yes
   b. No

*If "No", what is your role on the project?_____

Reach

"Reach" is defined as the quantity of people who have interacted with or benefited from your project. "Direct reach" includes people who have directly interacted with your project, such as teachers who participate in a professional development course. "Indirect reach" includes those who have benefited from people who interacted with your project, such as the students of the teachers who take a professional development course.

3. How many people do you expect your project to reach *directly,* e.g., through viewing exhibits, participating in events and programs or otherwise directly engaging with the materials related to your project?
   a. under 1,000
   b. 1,001 to 50,000
   c. 50,001 to 100,000
   d. 100,001 to 250,000
   e. 250,001 to 500,000
   f. 500,001 to 1,000,000
   g. Over 1,000,000

4. Do you have a plan in place to track your project's direct reach?
   a. Yes
   b. No
   c. Not Applicable

5. If “Yes”, approximately how many individuals have you directly reached thus far?
#_____

6. How many people do you expect your project to reach *indirectly*, e.g., students whose teachers participated in professional development, or children who take part in after-school programs where the counselors received professional development?

a. under 1,000
b. 1,001 to 50,000
c. 50,001 to 100,000
d. 100,001 to 250,000
e. 250,001 to 500,000
f. 500,001 to 1,000,000
g. Over 1,000,000

7. Do you have a plan in place to track your project’s indirect reach?

a. Yes
b. No
c. Not Applicable

8. If “Yes”, approximately how many individuals have you indirectly reached thus far?
#_____

Use of NASA Resources

NASA Resources are generated by NASA and could include written materials, displays, computer programs, curricula, equipment, logos, staff time, monetary support, or intellectual property.

9. Did you work with NASA officials in crafting your proposal?

a. Yes
b. No

*If “Yes”, will these or other individuals from NASA be involved in the implementation of your project?

a. Yes
b. No

10. Aside from grant funds you received from NASA, are there other NASA resources you have used?

a. Yes
b. No

*If “Yes”, please describe the NASA resources are you using:

_____
_____

11. Are you augmenting or expanding the NASA resources you are using?

a. Yes
b. No

*If “Yes”, please describe how you are augmenting or expanding the NASA resources:

_____

_____

12. Has NASA provided you with any help implementing your project?
    a. Yes
    b. No

*If “Yes”, please describe briefly:

_____

_____

13. How do you feel about the adequacy of your project’s budget?
    a. completely adequate
    b. mostly adequate
    c. just adequate
    d. not quite adequate
    e. not at all adequate

14. How confident do you feel that your project will be able to fulfill its goals?
    a. completely confident
    b. mostly confident
    c. just confident
    d. not quite confident
    e. not at all confident

Planned and Unplanned Outcomes

15. Please *briefly* state your project’s primary goal(s):

_____

_____

16. Have these goals changed since your proposal was written?
    a. Yes
    b. No

*If “Yes”, please explain:

_____

_____

Has your project achieved any of its goals thus far?
    a. Yes
    b. No

*If “Yes”, please list:

_____

_____

17. Have there been any benefits of your projects that you did not anticipate?
    a. Yes
    b. No

*If “Yes”, what were they?

_____
_____

18. Have there been any negative consequences of your projects that you did not anticipate?
    a. Yes
    b. No

*If “Yes”, what were they?

_____
_____

Sustainability

19. Do you expect any aspects of this project to continue beyond the duration of the CP4SMP grant?
    a. Yes
    b. No

*If “Yes”, please specify:

_____
_____

20. Have you secured any other support for this project beyond CP4SMP funds (e.g., other monetary support, physical space, access to materials, equipment, staff expertise, etc.)?
    a. Yes
    b. No

*If “Yes”, please describe:

_____
_____

*If “Yes”, does any of this come from your project’s host institution?
    a. Yes
    b. No

*If “Yes”, do you expect this support to continue after the CP4SMP grant period is over?
    a. Yes
    b. No

Partnerships

21. How many partners does your project have?
    a. 1-2
    b. 3-5
    c. 5-7
    d. 7-9
    e. 10+

22. In general, how important are partnerships to the functioning of your project:
    a. absolutely essential
    b. very important
    c. important
    d. not very important
    e. they are tangential
    f. my project does not engage in any partnerships

23. Which partnership(s) do you believe is/are the most essential to your project's success:
_____
_____

24. Please describe why you believe this/these partnership(s) is/are most essential to your project's success:
_____
_____

25. Have there been any changes to your partnerships since the grant proposal was written:
    a. Yes
    b. No

26. Please briefly describe the nature of changes to your partnerships:
_____
_____

Additional Comments

27. Please list any additional comments/information below that would help us understand the status of your project:
_____
_____
_____
_____
_____
_____
_____

Thank you for completing this questionnaire!

The National Aeronautics and Space Administration (NASA) is sponsoring an evaluation of NASA's Informal Education Program. The evaluation will focus on five selected projects to provide information to NASA's Office of Education regarding these projects' sustainability, reach into their respective communities, use of NASA resources and materials, progress toward stated goals, and development of strategic partnerships. The approach will allow NASA to document a range of activities in its portfolio of Informal Education and to better understand the effectiveness of the projects funded by the Office of Education.

Your input is important to help us understand the work of the projects selected for the Evaluation. We are asking you to take part in a two-hour focus group. We will be asking you to respond to a set of questions about you and the work you are doing on your CP4SMP project. There are a few things we would like to remind you about: 1) Your participation is entirely voluntary—you can choose to discontinue participation at any point or answer some questions and not others; 2) No individuals will be identified by name however we cannot assure confidentiality because job titles may be used in our Evaluation report to NASA; and 3) We will be taking notes during our conversation today—with your permission, we would also like to audiotape our conversation to help support our notes.

I'm going to hand out consent forms for you to sign and return to me.

Does anyone have questions before we begin?

Goals of the proposal review:
As one of the five projects selected for the Informal Education Evaluation, the overarching purpose of looking at the CP4SMP proposals is to determine the degree to which, individually and as a whole, the projects being funded by NASA OE dollars are:

1. reaching into the informal education community and beyond;
2. utilizing and expanding NASA resources and materials;
3. achieving planned (and unplanned) goals;
4. establishing sustainability; and
5. using partnerships to increase the impact and sustainability of the proposed work

Goals of the focus groups:
The purpose of the focus groups will be to understand the perspectives and early experiences of the CP4SMP grantees on topics related to the implementation of their projects that are not discernable in the proposals. In particular, we will explore:

1) Project leaders' vision about their projects' activities and intended outcomes
2) Challenges and opportunities project leaders see for accomplishing their projects' goals relative to partnerships, sustainability, reach into the community, use of NASA resources, implementation, and project impacts
3) Potential strategies project leaders have identified for dealing with challenges—taking advantage of opportunities and minimizing barriers

1. Project description/Introduction
2008 & 2009 recipients: (10-12 minutes)
In order to give everyone in the group, and the facilitators, an introduction to each other and their projects, we'll ask each focus group participant to give a 1 minute elevator description of their project – its primary activities, goals, and audience. We'd also like to get a sense of where each project is in the

implementation process. Have you begun reaching your target audience or are you still in the earlier phases of implementing your activities?

2. Reach into the community

2008 recipients:

You've set yourselves outreach goals for your projects.

a) What obstacles have you encountered that have had (or may have) an effect on your projects' abilities to achieve these goals?
b) What opportunities or supports have you encountered that have had (or may have) an effect on your projects' abilities to achieve these goals?

2009 recipients:

You've set yourselves outreach goals for your projects.

a) What obstacles do you anticipate might have an effect on your projects' abilities to achieve these goals?
b) What opportunities or supports are you relying on to help your project achieve these goals?

3. Partnerships

2008 recipients:

You have identified partners for your projects.

a) How would you describe your relationship with your partner(s); is the collaboration(s) working as you expected?
b) How integral to the success and overall mission of the project are your partners?
c) To what extent are they fulfilling (or not) the roles you anticipated?
    i. If they're not, what's getting in the way?
    ii. If they are, what's making it possible?

2009 recipients:

You have identified partners for your projects.

a) How would you describe your relationship with your partners?
    b) How integral to the success and overall mission of the project are your partners?
c) What challenges do you anticipate, if any, in their ability to fulfill their role in the project?

4. Planned and unplanned outcomes

2008 recipients:

You articulated specific outcomes in your proposals, and you probably anticipated some challenges in terms of meeting them.

a) How are your projects doing with regard to those goals in this first year?
b) What challenges are coming up that you anticipated?
    i. How have you been able to address them?
c) Are there any that you didn't expect?
    i. How have you been able to address them?
d) Are the supports that you counted on available to you?
e) Are there other supports available that you didn't anticipate?
    i. How have you been able to take advantage of them?
f) Now that your project is underway, to what extent do you feel the need to revisit your evaluation plan? Why?

2009 recipients:
You articulated specific outcomes in your proposals, and you probably anticipated some challenges in terms of meeting them.

a) What challenges do you anticipate?
b) What are your thoughts about how you might deal with them?
c) What supports are you counting on?

5. Use of NASA resources

2008 recipients:

a) Beyond the funding dollars that NASA has given to support your projects, what other NASA resources, if any, are you taking advantage of for your project?
b) How easy or difficult is it to identify potential NASA resources that could be useful to your project?
c) How important to the success of your project are the NASA materials you are using?
d) Are you able to augment/expand the NASA resources or materials you are using? If so how?

2009 recipients:

a) Beyond the funding dollars that NASA has given to support your projects, what other NASA resources, if any, do you plant to take advantage of for your project?
b) At this point in your project's development, do you have a sense of how easy or difficult it will be to identify potential NASA resources that could be useful to your project?

6. Sustainability

2008 & 2009 recipients:

a) What aspects of your project would you like to see sustained beyond the grant?
b) What do you think has the greatest likelihood of being sustained?
c) What obstacles do you see to their sustainability?
d) What supports might make sustainability more likely?

7. Working with NASA

2008 & 2009 recipients:

a) What has been your experience working with NASA as a grant recipient?
b) What are the obstacles you have experienced in your relationship with NASA?
c) What is working well in your relationships with NASA?

Appendix C

Survey: Distinguishing NASA's Informal Education and Outreach Activities

Informal Education and Outreach Activities at NASA

Your input is important to help us understand how NASA engages in Informal Education activities and Outreach efforts, both in definition and in practice. Please answer the questions below to the best of your ability. Keep in mind that: 1) Your participation is entirely voluntary—you can choose to discontinue participation at any point or answer some questions and not others, refusal to participate or discontinuation will involve no penalty or loss of benefits; 2) All information will be presented in aggregate along with approximately 60 other responses; NASA will only have access to individual data with no identifying information. When you are finished with your questionnaire, you can return it via email, fax, or US mail. If you would prefer, you may also call the number below to give your responses by telephone. Questionnaires are due by **Monday, June 28, 2010**. Please address responses to:

Alyssa Rulf Fountain
Abt Associates
55 Wheeler St.
Cambridge, MA 02138
alyssa_rulf_fountain@abtassoc.com
617.520.2657 (telephone)
617.386.7608 (fax)

Thank you!

A. Respondent Demographics

Please place a check mark next to all applicable responses

1. How would you describe your position at NASA?
   - a. Contractor/IPA ☐
   - b. Civil Servant ☐
   - c. Funded by the Office of Education ☐
   - d. Funded by a Mission Directorate ☐
   - e. Funded by a Center ☐
   - f. Funded by the Office of Communications ☐

2. In what area of Education or Outreach is your expertise?
   - a. Informal Education ☐
   - b. K-12 Education ☐
   - c. Higher Education ☐
   - d. Exhibits (Outreach) ☐
   - e. Speakers Bureau (Outreach) ☐
   - f. Other *(please explain)* ☐

B. Questionnaire

Please read the statements below and select the number representing the degree to which you agree or disagree with each statement:

1= Disagree strongly
2= Disagree somewhat
3= Neither agree nor disagree
4= Agree somewhat
5= Agree strongly

Question	Rating (1-5)
1. **In principle**, there are clear distinctions between Informal Education and Outreach activities at NASA	
2. **In practice**, there are clear distinctions between Informal Education and Outreach activities at NASA	
3. Informal Education activities require the use of standards-based materials	
4. Outreach activities require the use of standards-based materials	
5. Activities utilizing curricula, lesson plans, or teaching guides should be considered Informal Education	
6. Informal Education projects have reporting requirements	
7. Outreach activities have reporting requirements	
8. Informal Education and Outreach staff regularly collaborate	
9. Informal Education and Outreach activities target different audiences	
10. Informal Education activities target students and educators	
11. Outreach activities target the general public	
12. Informal Education activities require the individual leading the activity to have an education background	
13. Outreach activities require the individual leading the activity to have an education background	
14. The intent of Outreach activities is to raise awareness of NASA's mission	
15. The intent of Informal Education activities is to promote self-directed learning	
16. NASA-funded exhibits are a form of Informal Education	
17. Social media (e.g., Twitter, Facebook, blogs) are considered Informal Education	
18. Social media (e.g., Twitter, Facebook, blogs) are considered Outreach	

For questions 19 & 20, please use the 1-5 scale below to rate the degree to which you agree or disagree with the statements:

1= Disagree strongly
2= Disagree somewhat
3= Neither agree nor disagree
4= Agree somewhat
5= Agree strongly

19. A recent report by the National Academy of Sciences, *Learning Science in Informal Environments:* People*, Places, and Pursuits*, found evidence that nonschool science programs involving exhibits, media projects, emerging learning technologies, and other informal education programs increases students' interest in STEM education.	
	Rating (1-5)
a. Nonschool science programs involving exhibits are considered Informal Education at NASA	
b. Nonschool science programs involving media projects are considered Informal Education at NASA	
c. Nonschool science programs involving emerging learning technologies (such as Twitter) are considered Informal Education at NASA	
20. Mission Directorates, Education and Communications Offices work together on exhibits to ensure fulfillment of the Space Act of 1958's mandate to "provide for the widest practicable and appropriate dissemination of information concerning NASA's missions, programs and the results thereof." This collaborative approach is necessary and adequate to ensure a NASA STEM educational experience.	

Please check all applicable responses.

21. I use performance measures to plan and implement Outreach activities

a. Yes ☐
b. No ☐
c. N/A-I don't plan or implement Outreach activities ☐

22. If you currently collect performance data on your Outreach efforts, what is/are your metric(s) for a successful activity?

a. Number of participants attending an activity ☐
b. Number of handouts distributed at an activity ☐
c. Length of time participants spend at an activity ☐
d. I don't have an opinion about Outreach metrics ☐
e. N/A—I don't do Outreach ☐
f. Other *(please describe)* ☐

23. Do you think NASA should begin systematically collecting performance measures for Outreach activities?

    a. Yes ☐
    b. No *(please explain)* ☐

24. Are NASA Visitor Centers institutions of Informal Education?

    a. Yes ☐
    b. No *(please explain)* ☐

25. If there are any characteristics that distinguish Informal Education activities from Outreach activities at NASA, please describe them.

Appendix D

CP4SMP Grantees

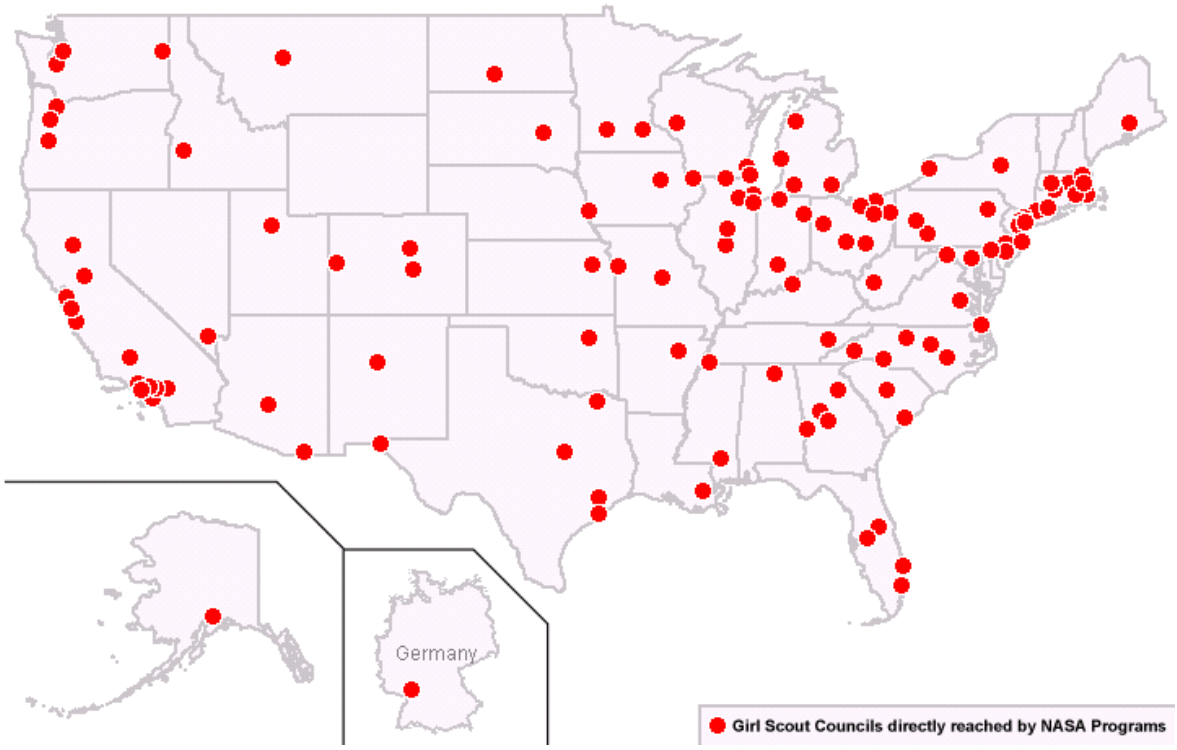
2008 & 2009 CP4SMP Grantees			
2008 Grantee	**Content Area**	**2009 Grantee**	**Content Area**
STARS: Strengthening Teaching, Awareness and Resources in Science	Earth Science Space Exploration Space Science	Climate Change: NASA's Eyes on the Arctic	Earth Science
NASA Science Research Mentoring Program (NASA SRMP)	Earth Science Space Exploration Space Science	Challenger Reach 2 U	none listed in proposal
Climate Change Education	Exploration	Expanding Boundaries: Harrison Schmitt and the Next Mining Frontier	Space Exploration Space Science
Take Flight!	Aeronautics	Mission LEAP: Lunar Expedition for Astronaut Pioneers	Space Exploration
Aviation Adventure Center with Traveling Flight Science Lab	Aeronautics	Mission to Mars: An Urban/Rural Collaborative to Inspire NASA's Next Generation	Space Exploration Space Science
The Dynamic Earth: You Have to See It to Believe It!	Earth Science	The Nature Research Center	Aeronautics Earth Science Space Exploration Space Science
Methods of Increasing Awareness of Comparative Planetology and Climate Science with Science on a Sphere in Museum Settings	Earth Science Space Exploration Space Science	NASA Science and Technology on the Family Calendar	Earth Science Space Exploration Space Science
Fulldome Planetarium Show for Space Science: A Pilot Project	Earth Science Space Exploration Space Science	Earth from Space: Exploring Satellite Data to Better Understand Global Systems	Earth Science Space Science
Youth EXPO: Exploring the Potential of Virtual Worlds	Space Exploration	Journey into Space	Earth Science Space Science
Sunstruck! How the Sun Rocks Our World	Space Science		
Montana's Big Sky Space Education: The NASA Exploration Space at ExplorationWorks	Aeronautics Microgravity Space Exploration Space Science		
Space-Age Oceanography: Exhibition and Education	Earth Science Space Exploration		
Explore the Galaxy!	Space Exploration Space Science		

2010 CP4SMP Grantees	
Grantee	**Content Area**
Arizona Sonora Desert Museum, Inc	Earth Science
The Childrens Museum, Hartford	Earth Science Space Exploration Space Science
The Children's Museum Of Indianapolis, Inc	Aeronautics
Louisiana Art & Science Museum Zeiss Planetarium	Space Exploration
Maryland Academy of Sciences dba Maryland Science Centre	Space Exploration Space Science
Science Museum of Minnesota dba Science Explore Store	Space Exploration
Dayton Society of Natural History, Boonshoft Museum of Discovery	Earth Science Space Science
Thanksgiving Point Institute, Inc	Space Science
Pacific Science Center Foundation	Space Exploration

Appendix E

Map of Individual Girl Scout Councils Reached by NASA

Map Identifying the Location of the Individual Councils NASA Had Reached Through Its Mission Directorates and Field Center Projects Between 1999 and 2006



Appendix F

Summary of NASA Activities with Girl Scouts USA and Boy Scouts of America

Exhibit F.1. NASA Center Activities with the Girl Scouts of the USA – January 1, 2009 through December 31, 2010

Project or Event	Date	Participation
Ames Research Center		
Robotics Alliance Project's Space Cookies - NASA-Girl Scouts robotics team of 15 girls which competes in the FIRST (For Inspiration and Recognition of Science and Technology) Robotics Competition	2009, 2010	25 Scouts
The Future is Green - a week long, summer residential program for older girls, where they learn about STEM topics such as robotics and astrobiology through hands-on activities	Jul 2010 (planned)	~40 Scouts
Girls Go Tech Career Day - NASA personnel talk with girls about their careers in technology and engage them in hands-on activities	Feb 2009, Feb 2010	1,300 Scouts
Space Shuttle Launch - Girls Scouts from the local council attended a space shuttle launch	Feb 2010	6 Scouts
Discoveree - a training program for older girls and adults about NASA technology	2009	30 Scouts
NASA hosts two booths (one technology, one for Space Cookies) that engage Scouts in hands-on activities ***Golden Gate Bridging***, an event which celebrates the girls' bridging from Juniors to Cadettes	May 2009 May 2010	6,000 Scouts attended the event in 2009; 5,000 in 2010
Ames hosts the ***FIRST LEGO™ League Robotics Tournament*** in which Girl Scout teams compete	Nov 2009 Nov 2010 (planned)	~350 participants
Dryden Flight Research Center		
Discovery Dome presentation - Presented at Girl Scouts Troop 432's ***Family Night***	Apr 2009	75 Scouts and family members
Girl Scouts Brownie Space Explorer Try It Workshop- badge earning event	Apr 2009	49 Scouts
Girl Scouts Brownie Space Explorer Try It Workshop - badge earning event	Apr 2009	32 Scouts
Girl Scouts Junior Sky Search Badge Workshop - Badge earning event	Apr 2009	36 Scouts
Girls Scouts Leader Training	May 2009	16 leaders
Girl Scouts Brownies and Junior Mini Badge Workshop - badge earning event	May 2009	22 Scouts
Girl Scouts Cadettes Space Explorer Interest Project	May 2009	34 Scouts
Glenn Research Center		
Intergalactic Discovery Day - Astronomy and space exploration fair with ~20 activities and displays for grades 2-5	Mar 2009	200 Scouts
Space Race – presentation about the 1960s race to the Moon for girls bridging from Junior to Cadettes (i.e., finishing grade 5)	Jun 2009	167 Scouts
NASA Career Day – shadowing day including career panel, tours, etc. to inspire older girls (grades 9-12) to consider career futures in STEM	Jul 2009	11 Scouts
LCROSS Impact Party – camp overnight for Girl Scout astronomy club to view the LCROSS spacecraft impact via NASAtv	Sep 2009	13 Scouts
Engineer for a Day – ~14 engineering design challenges for ages 11-17	Oct 2009	~40 Scouts, 10 adults
Space Station Science Day - ~20 activity stations for grades 2-5 related to space exploration, aviation, and science in genera	Mar 2010	200 Scouts
NASA Career Day – shadowing day including career panel, tours, etc. to inspire older girls (grades 9-12) to consider career futures in STEM	Jun 2010 (planned)	25 Scouts

Exhibit F.1. NASA Center Activities with the Girl Scouts of the USA – January 1, 2009 through December 31, 2010

Project or Event	Date	Participation
Afternoon at Plum Brook Station – facility tours (of B-2 and SPF) and hands-on activities for ages 11-17	Oct 2010 (planned)	50 Scouts & leaders
Robotics Extravaganza – overnight event where girls (ages 11-17) will design, build, and program LEGO Mindstorms NXT robots	Nov 2010 (planned)	55 Scouts
Goddard Space Flight Center		
Girls in Space - Training for Girl Scouts trainers in NASA content and activities to enable Girl Scouts leaders to facilitate astronomy clubs and events in their local councils	2009-2010	10 leaders per year
Girl Scouts Leader Training - professional development program for Girl Scouts leaders to inspire young women to pursue careers in science, technology and mathematics	NA	NA
Girl Scouts Day at Udvar Hazy - badge earning activities (AESP activity)	Mar 2009	700 Scouts
Girl Scouts Astronomy Badge Program - badge earning activities (AESP activity)	Apr 2009	26 Scouts
International Marconi Day - Full day of events regarding communications past and future; specifically coordinating space science learning standards with grades 5-7 teachers and students, and linked with Scouts. (AESP activity)	Apr 2009	72 students
Monthly rocket launches at Goddard's Visitor Center	Monthly	100-300 observers, some of whom are Scouts
A.C.E. of Space - Hosted girl-led group of the Girl Scouts of Central Maryland council. This group meets regularly to explore space topics through hands-on activities, presentations, tours of NASA facilities, meeting successful female scientists/professionals, etc	Mar- Dec 2009	15 Scouts
Big Explosions and Strong Gravity (BESG)- Girl Scouts joined scientists for a day of exploration into supernovae and black holes, participating in hands-on activities	Apr 2010	67 Scouts
Jet Propulsion Laboratory		
Tours for Girl Scouts		
Johnson Space Center		
21st Century Explorer - Adapting this NASA developed, afterschool program for implementation with Girl Scouts in Iowa		

Exhibit F.1. NASA Center Activities with the Girl Scouts of the USA – January 1, 2009 through December 31, 2010

Project or Event	Date	Participation
Space Center Houston's (Johnson's Visitor Center) ***Scout Camp-Ins for Cadettes/Seniors/Ambassadors*** during which the older scouts conduct a variety of activities for the Space Exploration interest project including participating in a scavenger hunt to discover history of spaceflight, building and launching an air pressure rocket, constructing a Martian base, and learning how to teach night sky activities to younger scouts.	Jan 24, 09	308 Campers*
	Jan 30, 09	122 Campers*
	Feb 28, 09	134 Campers*
	Apr 4, 09	203 Campers*
	May 9, 09	240 Campers*
	Aug 15,09	289 Campers*
	Sep 26,09	295 Campers*
	Nov 13,09	55 Campers*
	Dec 5, 09	268 Campers*
	Jan 30, 10	105 Campers*
	Feb 27, 10	432 Campers*
	Mar 26, 10	64 Campers*
	May 8, 10	236 Campers*
	Aug 21,10 (planned)	
	Sep 25,10 (planned)	
	Oct 30, 10 (planned)	
	Nov 19,10	

Exhibit F.1. NASA Center Activities with the Girl Scouts of the USA – January 1, 2009 through December 31, 2010

Project or Event	Date	Participation
Space Center Houston's (Johnson's Visitor Center) ***Scout Camp-Ins for Juniors*** where young Scouts conduct activities for the Junior Aerospace Badge, constructing and flying a shuttle glider, designing a spacecraft for a specific mission, and discovering what astronauts eat and design a protective spacesuit.	Jan 24, 09 Jan 31, 09 Mar 28, 09 Apr 4, 09 Apr 24, 09 Jun 27, 09 Sep 5, 09 Sep 26,09 Oct 10, 09 Nov 7, 09 Dec 5, 09 Jan 2, 10 Feb 27, 10 Mar 13, 10 Apr 24, 10 May 14,10 Jun 26, 10 (planned) Sep 11,10 (planned) Oct 8, 10 (planned) Nov 6, 10 (planned) Dec 11,10 (planned)	Included above 313 Campers* 316 Campers* 203 Campers* 300 Campers* 304 Campers* 243 Campers* Included above NA 339 Campers* Included above NA Included above 232 Campers* 320 Campers* 298 Campers*

Exhibit F.1. NASA Center Activities with the Girl Scouts of the USA – January 1, 2009 through December 31, 2010

Project or Event	Date	Participation
Space Center Houston's (Johnson's Visitor Center) ***Scout Camp-Ins for Brownies*** where the Scouts explore space by conducting activities for the Brownie Space Try-It Badge, learning about and designing a spacesuit, discovering constellations in an inflatable planetarium, building and launching a basic rocket.	Jan 17, 09 Feb 14, 09 Mar 7, 09 Mar 21, 09 May 2, 09 Jul 11, 09 Sep 19,09 Oct 31, 09 Nov 20,09 Jan 16, 10 Feb 19, 10 Mar 6, 10 Apr 17, 10 May 7, 10 Jul 10, 10 (planned) Sep 25,10 (planned) Oct 16, 10 (planned) Dec 3, 10 (planned)	155 Campers* 94 Campers* 108 Campers* 56 Campers* 148 Campers* 292 Campers* 289 Campers* NA 77 Campers* NA 153 Campers* 337 Campers* 336 Campers* 331 Campers*
Scout Leader Open House at Space Center Houston, Johnson's Visitor Center	Feb 21, 09 Feb 27, 10	33 leaders Included above
Space Out Day – an annual one-day event put on by the Girl Scouts of San Jacinto Council of thematic activities and speakers related to a general or specific space theme	Sept 2009	~100-200 Scouts
Kennedy Space Center		
Lunabotics Mining Competition - Scouts observe this challenge for university students and participate in a "Science on a Sphere" lesson, rocket building workshops, as well as attend a Q&A panel of NASA scientists	May 2010	100 Boy and Girl Scouts
Launch of STS-133 - Attend launch and participate in workshops	Sep 2010 (planned)	
Train the Trainer Workshops - Training for Citrus Council trainers	2009, 2010 (four times a year)	
Day camp (for scouts) & "Train the Trainer" Workshop - Training for leaders of the Gateway and West Coast Councils and one-day camp for girls	2009, 2010 (twice a year)	
Badge earning activities in Tampa, FL	Feb 2009 Feb 2010	800 Scouts
Langley Research Center		
Engineering patch event - With the Society of Women Engineers and the Girl Scouts Council of Colonial Coast, hosting an during which Girl Scouts participate in hands-on activities on basic engineering principles		

Exhibit F.1. NASA Center Activities with the Girl Scouts of the USA – January 1, 2009 through December 31, 2010

Project or Event	Date	Participation
Girl Scouts Jamboree - Hosting 8-10 booths on NASA STEM topics		
Techno Girls		
Girls Rock-it		
Girl Scouts Technical Career Exploration - workshop engaging girls in hands-on robotic activities (AESP activity)	Feb 2009	140 Scouts
Marshall Space Flight Center		
Train the Trainer and 2-day workshops for girls - Designed for ages 9-14, these workshops incorporate hands-on STEM-based activities including design challenges from the "Working on the Moon" NASA educator guide to develop the girls' skills in STEM and inspire them to pursue STEM careers	Nov 2010 (planned)	~200 Scouts
LEGO™ robotic training for Girl Scouts leaders in Lafayette, LA, preparing the leaders to involve girls in For Inspiration and Recognition of Science and Technology (FIRST) LEGO League Robotics activities and other hands-on, STEM-based activities including design challenges.	Feb 2010	11 leaders
LEGO™ robotic training for Girl Scouts leaders in Memphis, TN	Mar 2010	15 leaders
LEGO™ robotic training for Girl Scouts leaders in Knoxville, TN	Mar 2010	9 leaders
LEGO™ robotic training for Girl Scouts leaders in Mobile, AL	Fall 2010 (planned)	~20 leaders
LEGO™ robotic training for Girl Scouts leaders in Springfield, MO	Jun 2010 (planned)	~20 leaders
LEGO™ robotic training for Girl Scouts leaders in Kansas City, MO	Oct 2010 (planned)	~20 leaders
Girl Scouts Event Day - On the first day, girl Scouts toured Marshall Space Flight Center (MSFC) and explored NASA careers; during the second day, Scouts participated in hands-on STEM classes including building a rocket, designing a Mars rover, and constructing a Mars parachute in Huntsville, AL	Nov 2009	Day 1 – 9 Scouts Day 2 - 147 Scouts
Girl Scouts Event Day in Hot Springs, AR - Hands-on STEM activities including building and launching a model rocket	Mar 2010	82 Scouts
Girl Scouts Event Day in Mobile, AL	Apr 2010	89 Scouts
Girl Scouts Event Day in Mason City, IA	May 2010	59 Scouts
Stennis Space Center		
Girl Scouts Extravaganza - Astro Camp hosted a booth at the event	2008, 2009	1,500 Scouts
Wallops Flight Facility		
None currently.		

Sources: Reports from 10 informal leads (missing Ames) at the Centers, March- May 2010; interviews with NASA staff engaged in Scouting activities; materials (e.g., briefings, emails, and annual reports) forwarded to the project team by NASA staff.

NA= Not available.

*: Participation counts include Scouts and their parents.

Please note: we are still in the process of verifying this information.

Exhibit F.2. NASA Center's Activities with the Boy Scouts of America - January 1, 2009 through December 31, 2010

Project or Event	Date	Participation
Ames Research Center		
Robots on the Road **-** event with Boy Scouts of America at Fort Lewis (AESP activity)	Aug 2009	1,000 Scouts
Dryden Flight Research Center		
Boy Scout Recruitment at AERO Institute - brought together several different Cub Scout packs and the general public to introduce them to the locally available Scouting activities; introduced what NASA would be able to do for their packs including its Discovery Dome and the Belt Loop and Pin activities; a photo kiosk was available to take pictures in a space suit on the surface of the Moon.	Jun 2009	30 Scouts
Discovery Dome presentation at Boy Scout Pack #164's ***Dinosaur Prophecy***	Apr 2009	30 Scouts
Discovery Dome presentation at Boy Scout Troop #390's ***tour of Dryden Flight Research Center***	Apr 2009	29 Scouts
Discovery Dome presentation at Boy Scout Troop #932's ***tour of Dryden Flight Research Center***	May 2009	14 Scouts
Glenn Research Center		
Exhibiting at the ***Greater Cleveland Council Centennial Camporee***	May 2010 (planned)	~3,000 Scouts, leaders, and visitors
In collaboration with BSA, offers the ***Glenn Exploring Program***, a weekly program occurring between October and April, where the exploring students work on projects including aeronautics activities, computer technology, human space flight and balloon satellite technology. Program includes 8 Posts; Glenn is hosting the closing ceremony in May 2010	Once a week between Oct 2009 – May 2010	54 Exploring students
Updating the ***"Eagle Scout" Poster*** which will recognize the Eagle Scouts who have and continue to serve as NASA astronauts for the 2010 National (BSA) Scout Jamboree	July 2010 (planned)	n/a
Goddard Space Flight Center		
Space-Themed Boy Scout Camp for Anne Arundel County in MD - Scouts participated in NASA education activities and Goddard's GeoDome Planetarium Shows at Camp Tomahawk's Boy Scout Jamboree (AESP activity)	Jul 2009	530 Scouts
Monthly rocket launches at Goddard's Visitor Center	Monthly	100-300 observers, some of whom are Scouts
Trained Scout leaders on NASA education activities used in MD counties' space themed Scout camps	Summer 2009	~12-15 Scout leaders
Jet Propulsion Laboratory		
Rocket launches during which a NASA representative was to speak to the Cub Scout Pack 637	Mar 2010	
Tours for Boy Scouts		

Exhibit F.2. NASA Center's Activities with the Boy Scouts of America - January 1, 2009 through December 31, 2010

Project or Event	Date	Participation
Johnson Space Center		
Space Center Houston's (Johnson's Visitor Center) ***Scout Camp-Ins for Boy Scouts,*** where Scouts participate in activities for the Space Exploration Merit Badge, including building and launching an air pressure rocket, designing and building a Martian base, constructing a space station, exploring the Starship Gallery and seeing NASA spacecrafts that have been to the moon	Jan 9, 09 Apr 18, 09 May 8, 09 Jul 25, 09 Oct 9, 09 Nov 6, 09 Feb 13, 10 Apr 16, 10 May 1, 10 Aug 7, 10 (planned) Oct 9, 10 (planned) Nov 20,10 (planned)	125 Campers* 269 Campers* 190 Campers* 267 Campers* 32 Campers* NA 325 Campers* 232 Campers* 277 Campers* 322 Campers*

Exhibit F.2. NASA Center's Activities with the Boy Scouts of America - January 1, 2009 through December 31, 2010

Project or Event	Date	Participation
Space Center Houston's (Johnson's Visitor Center) ***Scout Camp-Ins for Cub Scouts.*** Three separate events: ***Webelos*** - Cub Scouts complete components of the Scientist Badge by designing a protective spacesuit and conducting activities involving Bernoulli's Principle and Pascal's Law ***Bears*** - Cub Scouts complete Space Arrow Points Badge while exploring the planets in the Solar System, building and launching a basic rocket, making a star wheel chart and learning about constellations in the Center's planetarium ***Wolves*** - Cub Scouts participate in activities towards completing a Cub Scout Astronomy Belt Loop and the Astronomy Academics Pin; they make telescopes. Work with a solar system model, experience the center's planetarium to find constellations in the night time sky, and explore Space Center Houston's exhibit on early space missions	Jan 10, 09 Feb 13, 09 Mar 6, 09 Mar 14, 09 Apr 25, 09 May 16,09 Jun 20, 09 Aug 8, 09 Aug 22,09 Sep 12,09 Oct 24, 09 Oct 30, 09 Nov 14,09 Nov 21,09 Dec 4, 09 Dec 12,09 Jan 9, 10 Jan 23, 10 Feb 20, 10 Mar 20, 10 Mar 27, 10 Apr 10, 10 Apr 23, 10 May 15,10 Jun 19,10 (planned) Jul 24, 10 (planned) Aug 28,10 (planned) Sep 18,10 (planned) Oct 2, 10 (planned) Oct 23, 10 (planned) Nov 12,10 (planned) Nov 13,10 (planned) Dec 4, 10 (planned)	319 Campers* 181 Campers* 287 Campers* 284 Campers* 195 Campers* 266 Campers* 300 Campers* 238 Campers* 51 Campers* 200 Campers* 29 Campers* 270 Campers* 146 Campers* 292 Campers* 125 Campers* 35 Campers* 311 Campers* 145 Campers* 272 Campers* 330 Campers* 224 Campers* 210 Campers* 239 Campers* 159 Campers*

Exhibit F.2. NASA Center's Activities with the Boy Scouts of America - January 1, 2009 through December 31, 2010

Project or Event	Date	Participation
Kennedy Space Center		
Lunabotics Mining Competition (a higher education challenge for university students), to which 100 Scouts are invited to watch and participate in a "Science on the Sphere" lesson, rocket building workshops, as well as attend a Q&A panel of NASA scientists	May 2010	100 Boy and Girl Scouts
NASA will bus in Girl and Boy Scouts to attend the ***launch of STS-133*** as well as participate in workshops	Sep 2010 (planned)	
	2011 (planned)	
Participating in the ***Boy Scouts' Central Florida Scout Show at Bright House Stadium at the University of Central Florida*** by hosting a booth as well as engaging Scouts in a 30 minutes presenting "Gee Whizz" demonstrations, such as the bowling ball pendulum.	May 2010	2,000 to 3,000 Scouts
With the ***Education Resource Center (ERC***), will host Boy Scouts and their friends once a month to meet with NASA scientists and engineers during the school year	2010-2011 (planned)	
STEM activities for Cub Scouts at the ***Oakwood Cub Scout Day Camp*** (AESP activity)	Jun 2009	
The ***STS-27 Launch*** was attend by a Boy Scout Group, sponsored by the Department of Homeland Security (AESP activity)	July 2009	10 boys
Operation Space Scout - Boy Scouts met to discuss informal education (AESP activity)	Aug 2009	NA
Boy Scout Planning Group meeting for new Space Badge (AESP activity)	Sept 2009	NA
Astronomy activities with the Boy Scout Troop 497 (AESP activity)	Jan 2010	18 Scouts
Langley Research Center		
Activities with the ***Boy Scouts of America Conclave*** where engaging Scouts in hands-on activities showcasing engineering challenges of the Constellation/ Mars program and the Exploration of Mars (AESP activity)	Apr 2009	627 Scouts
Langley has helped to provide ***NASA professional development workshops*** held at the Virginia Air and Space Center annually at the North Carolina Museum of Natural Sciences		10-20 Scout leaders per year
Also engaged Boy Scouts in STEM-related activities during day camps & overnights such as the space badge earning event with the ***Hartwood Days Organizing Committee – Venturing Crew*** (AESP activity).	Sep 2009	1,300 students, unknown # of Scouts
Marshall Space Flight Center		
To the moon again in 2010, a 5-day Cub Scout camp in Acadia Parish, LA, where Cub Scouts built and launched rockets	June 2010	39 Cub Scouts
A full day of NASA-led hands-on STEM classes as a part of a week-long ***camp with Boy Scouts*** in Rayne, LA	Jun 2010 (planned)	50 Scouts
Student Launch Initiative - Systems engineering challenge for middle and high school students. Participants design, build and launch a reusable rocket that carries a science payload to an altitude of 1 mile above ground level	Apr 2009	119 participants including 5 boy Scouts and 2 adult leaders
Stennis Space Center		
None currently		
Wallops Flight Facility		
None currently		

Exhibit F.2. NASA Center's Activities with the Boy Scouts of America - January 1, 2009 through December 31, 2010

Project or Event	Date	Participation

Sources: Reports from 10 informal leads (missing Ames) at the Centers, March-May 2010; interviews with NASA staff engaged in Scouting activities; materials (e.g., briefings, emails, and annual reports) forwarded to the project team by NASA staff.

NA = not available.

n/a= not applicable.

Please note: we are still in the process of verifying this information.

Appendix G

Frequencies and Means for Survey Items

Frequencies and means for Survey Items

Obs	Survey Questions	N	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree	Mean	SD
1	q1_PrincipleDistinctions	75	17.3333	30.6667	13.3333	29.3333	9.3333	2.82667	1.28792
2	q2_PracticeDistinctions	75	21.3333	40.0000	14.6667	17.3333	6.6667	2.48000	1.20090
3	q3_InformalStandards	75	13.3333	21.3333	16.0000	28.0000	21.3333	3.22667	1.36137
4	q4_OutreachStandards	76	50.0000	15.7895	15.7895	13.1579	5.2632	2.07895	1.29371
5	q5_CurriculaInformal	75	26.6667	17.3333	18.6667	24.0000	13.3333	2.80000	1.41421
6	q6_InformalReporting	73	2.7397	5.4795	10.9589	35.6164	45.2055	4.15068	1.00928
7	q7_OutreachReporting	75	6.6667	6.6667	21.3333	40.0000	25.3333	3.70667	1.12434
8	q8_Collaborate	76	9.2105	13.1579	18.4211	40.7895	18.4211	3.46053	1.20489
9	q9_TargetAudience	75	17.3333	25.3333	26.6667	21.3333	9.3333	2.80000	1.23025
10	q10_InformalTargetEducators	75	9.3333	13.3333	18.6667	37.3333	21.3333	3.48000	1.23420
11	q11_OutreachTargetPublic	75	2.6667	5.3333	14.6667	30.6667	46.6667	4.13333	1.03105
12	q12_InformalBackground	76	31.5789	25.0000	22.3684	15.7895	5.2632	2.38158	1.23253
13	q13_OutreachBackground	75	52.0000	25.3333	18.6667	2.6667	1.3333	1.76000	0.94211
14	q14_OutreachIntent	76	1.3158	1.3158	6.5789	28.9474	61.8421	4.48684	0.79151
15	q15_InformalIntent	75	6.6667	12.0000	34.6667	29.3333	17.3333	3.38667	1.11371
16	q16_ExhibitsInformal	76	6.5789	7.8947	30.2632	30.2632	25.0000	3.59211	1.14517
17	q17_InformalSocialMedia	75	30.6667	22.6667	22.6667	14.6667	9.3333	2.49333	1.31902
18	q18_OutreachSocialMedia	75	2.6667	4.0000	17.3333	33.3333	42.6667	4.09333	1.00234
19	q19a_InformalExhibits	75	9.3333	6.6667	21.3333	44.0000	18.6667	3.56000	1.15361
20	q19b_InformalMedia	75	13.3333	21.3333	21.3333	32.0000	12.0000	3.08000	1.24943
21	q19c_InformalTech	74	24.3243	18.9189	31.0811	18.9189	6.7568	2.64865	1.23235
22	q20_Collaboration	74	9.4595	14.8649	28.3784	22.9730	24.3243	3.37838	1.26819