INSPIRE
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Type of Agreement: Cooperative Agreement
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PROJECT DESCRIPTION

The Interdisciplinary National Science Project Incorporating Research and Education Experience (INSPIRE) is a multi-tiered student pipeline program designed for students in 9th to 12th grade, providing a vital link between NASA's Elementary/Secondary Projects and Higher Education projects. The scope and purpose of INSPIRE will place a heavy emphasis on the recruiting of underserved and underrepresented students to ensure a diverse pool of candidates from throughout the U.S.

Students selected to participate will:

- learn about science, technology, engineering and mathematics (STEM) fields of study and careers,
- participate in the INSPIRE online community,
- and compete for unique summer experiences at a NASA facility.

NASA's unique mission provides the content for the online community. Resources, activities and educational modules add relevancy to courses being taught in high school. Activities include participation in video teleconferences with NASA scientists, design competitions, and learning modules. The online community allows interaction with other students with similar interests, to ask questions and to share knowledge, thus building a Community of Practice. The online community also offers support for parents to help them better champion their student's goals.

Once selected into the online community, students are then eligible to compete for the following grade appropriate summer experiences:

Tier 1 (NASA Explorers): Rising 10th-grade students and their legal guardian compete to be awarded a summer visit to a NASA facility for a one-day VIP Tour and Workshop.

Tier 2A (Collegiate Experience): Rising 11th-grade students compete to participate in a two-week, on-campus residential experience during the summer at a college or university selected by NASA. This exposure to college students and faculty is designed to encourage improved study skills and the pursuit of higher education and careers in

STEM areas. The college or university provides lodging, meals, supervision, and educational activities.

Tier 2B (Residential Internship): Rising 12th-grade students who will be at least 16 years of age at the start of the internship compete to participate in a paid 8-week summer internship at a NASA facility. Students gain valuable on-the-job experience by working directly with NASA scientists and engineers during the work day and will participate in enriching after-work educational and cultural activities. During the internship, students receive:

- A stipend based on minimum wage for the state in which the NASA facility is located and lunch allowance to cover the workweek
- Meals and housing at a location within commuting distance from the NASA facility
- Transportation to and from work and any after-work project activities
- On-site supervision and structured enrichment activities after work hours
- During working hours, students are mentored by scientists and engineers at the NASA center.

Tier 3 (Collegiate Internship): Rising college freshmen who will be at least 16 years of age at the start of the internship compete for participation in a paid 8-week summer internship at a NASA facility. Applicants for this experience must have been accepted at a college or university and declared a STEM major. This experience provides valuable on-the-job training and introduces the students to other education and employment opportunities. Lodging, meals, transportation and after-work activities are the responsibility of the student. NASA will pay the student a stipend of $5,000 in three installments, providing all requirements have been met.

PROJECT GOALS

Goal 1:
Serve as a nationwide project to develop emerging adolescent and parental awareness and *understanding of STEM-related education and careers.*

Goal 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.*

Goal 3:
P*rovide 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.

PROJECT BENEFIT TO OUTCOME (1,2, OR 3)

INSPIRE benefits Outcome 2 by attracting and retaining students in STEM disciplines by providing students and families NASA resources and grade appropriate experiences through participation in the online community and unique summer experiences. These activities and experiences nurture and support students interest and understanding of STEM careers.

In addition, INSPIRE is a critical link in NASA's pipeline of programs, drawing students from the middle grades, from programs like NES and SEMAA and center-unique projects like Middle School Aerospace Scholars at JSC, and engaging them early in high school with NASA in STEM-related fields. As students exit INSPIRE, we will encourage them to expand their education and employment activity in next-level NASA programs such as Motivating Undergraduates in Science & Technology (MUST), Undergraduate Students Research Program (USRP) and Human Capital-sponsored programs such as the Student Temporary Employment Programs (STEP), the Student Career Experience Program (SCEP) and other internship programs.

PROJECT ACCOMPLISHMENTS *(CONNECTION BACK TO ANNUAL PERFORMANCE GOALS AND PLANS)*

Phased implementation of INSPIRE began at all 9 NASA centers and JPL in the spring of FY08 with the recruitment of students to consider for the Tiers 2B and 3 internships. Almost 420 applications were received, from which 154 students representing 23 states and Puerto Rico were selected to participate. Of those selected, 51% were female, 16% African American, 18% Asian-American, 9% Hispanic, 1% Native American, 1.4 % Pacifica Islander, and 5% "other". A total of 131 NASA and contractor employees participated in the mentoring aspects of the project.

With the approval of funding in January 2008, the goal of INSPIRE during remaining part of FY08 was to implement the summer internships and to lay the groundwork for full implementation during FY09. The foundation of the online community was established using a COTS product called "Desire 2 Learn" (D2L). D2L provided the capability for a discussion forum which allowed students to communicate with their peers at the other centers, share knowledge, their experiences, and to post pictures of their activities. D2L also provided the capability for students to post weekly activity logs and to complete questionnaires for evaluative purposes. Chaperones and mentors were also asked to share their knowledge and experiences while parents were asked to complete a pre and post summer experience questionnaire. While the level of parental and mentor participation was not as hoped, ideas are being explored to increase participation next year. During the later part of FY08, a framework of educational activities was established based upon six primary areas. The six educational activities will be continually refreshed to ensure student engagement in the areas of:

> Communication: "Ask an expert" where students can post questions to be answered by NASA astronauts, engineers, scientists or some other subject matter expert.

Data Analysis: Giovanni Web-based analysis tools to investigate hurricanes, climate change, etc.

Experiments: Such as the plant growth chamber.

Modeling: Student design competitions.

NASA History: Students learn about NASA's history through participation in stimulating bi-weekly quizzes.

NASA News: Relevant and timely NASA related news will be posted allowing students to participate in bi-weekly quizzes.

Students completing activities in the above areas will earn points that will be counted towards their participation in the project. Participation is one of the measures taken into consideration for selection of applicants for the summer experiences. To further encourage student completion of these OLC activities, the project will provide NASA items such as NASA lapel pins, posters, etc. when students earn certain point levels. The Tiers 2B and 3 internships provided numerous learning experiences for students and their families that reinforced student STEM aspirations and family support. To measure the effectiveness of the learning experiences, students and their parents were asked to complete a pre and post questionnaire in the D2L system. Findings indicate students reported significant increases in their interest and knowledge of NASA and STEM topics and careers. Finding from families indicate students developed numerous work-related and personal skills such as writing and speaking effectively, working with and understanding people of diverse backgrounds, developing clear career goals, solving real-world problems, and preparing for college.

During FY08, a solicitation was released to the Space Grant Consortia seeking proposals to provide the Tier 2A two-week on-campus collegiate experience. Eight proposals were submitted and selection is planned by October 31. The award of this solicitation will enable the project to provide the Tier 2A summer experience in FY09.

PROJECT CONTRIBUTIONS TO PART MEASURES (*INCLUDE DATA PLUS EXPLANATION)*

PART 9: Percentage increase in the number of elementary and secondary students participation in NASA instructional and enrichment activities.

154 students participated in INSPIRE during FY08.

PART 10: Percentage of students expressing interest in science and technology following their involvement in NASA elementary and secondary education programs.

Of the 154 students who participated, 130 (84%) indicated STEM career interest.

IMPROVEMENTS (e.g. project management, efficiencies, etc.) MADE IN THE PAST YEAR

INSPIRE's original model limited student and family participation to a 50 mile radius of each center. To make INSPIRE a nationwide project, the model was revised to include the online community that provides the capability for thousands of students and families nationwide to have exclusive access to NASA education content and activities and to build a community of practice. In addition, Tier 2B now provides a residential component to the internship, allowing INSPIRE students across the country to be considered and participate in the internships at each center.

FY08 was the 1st year for INSPIRE implementation therefore no previous history exists to compare to and make improvements upon. However, a meeting with all center project specialists and Oklahoma State University was held in October to review lessons learned and plan for full implementation during FY09.

Improvements planned for FY09 based on FY08 lessons learned include: Not allowing students to opt out of the residential component to ensure full participation on all after work and weekend activities, adding funding to the OSU 2nd year option to allow for a helper for Tier 2A chaperones, process modifications, and roles and responsibilities clarification.

PROJECT PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION (*THIS IS WHERE FURTHER FOLLOW-UP TO OCCUR FOR COLLECTING 2008 GRANTEE PERFORMANCE SUMMARIES FOR PUBLISHING TO OUR EDUCATION HOME PAGE)*

As the primary project partner, Oklahoma State University (OSU) provides administrative support for project implementation such as, logistical support for the residential component of Tier 2B, chaperones, payment of stipends, recruitment and the online community capability. 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 is working with Hispanic Serving Institutions. Internal evaluation of the project is done through the Technology for Learning Consortium, Inc.