

2010 Annual Performance Report K12 Cooperative Agreement Notice (CAN)

Administered: GSFC Education Office-Code 160
Agreement: Cooperative Agreement(s)
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Project Description

The K-12 Cooperative Agreement Notice (CAN) is a competitive effort that identifies proposed projects that incorporate innovative approaches for development and delivery of instructional materials and experiences that capture the interest of learners and actively involve them in relevant, NASA science, technology, engineering and mathematics (STEM), STEM-themed and career development at the high school level.

A Congressional appropriation was established in 2008 to improve STEM teaching and learning at the high school level. NASA'S Office of Education, Elementary and Secondary Division established and delivered the competitive grant opportunity. The first awards were granted in 2008. Solicitations were modified in 2009 and 2010 to capture the most recent research in the areas of focus.

Between 2008 to 2010, awards have been granted to 33 formal and informal education organizations linking to secondary institutions: awards range from \$400,000 to \$1 million totaling \$27.5 million dollars. Awards have been made in the following 17 states, some states have more than one awarded project: California, Delaware, Florida, Georgia, Idaho, Illinois, Louisiana, Maine, Maryland, Massachusetts, Missouri, New Jersey, New York, North Carolina, Ohio, Texas, Virginia, and Washington, D. C.

K-12 CAN Project Goals

- Provide professional and technical assistance to awarded projects to ensure accomplishment of education goals
- Implement communication strategies for the three groups (years) of awardees to share and exchange expertise
- Identify geographic areas to market the funding opportunity due to limited response
- Plan to conduct a 2011 call for new proposals modified to address new focus of NASA K-12.

- Leverage NASA resources to increase the visibility of the funding opportunity nationwide
- Develop structure for evaluating success of the full program consistent with Agency metrics

Project Benefit to Outcome 2

- Increased use of NASA education resources at the high school level
- Increased number of students exposed to STEM careers
- Improved STEM instruction

Project Accomplishments

- Successful Symposium in May 2010. Thirty two participants from the 2008 and 2009 awards were in attendance. Principal investigators (PI's) and project managers not attendance participated through Ellumination. 100% of the awards participated in one of the formats.
- Successfully released the 2010 K-12 CAN and made awards before September 30, 2010
- Successfully provided training for PI's/designee to enter data into OEPM (Outcome 2.3)
 - Training sessions were scheduled via telecom for PI's/designee and during the May Symposium to train users on the new system. Samples of surveys were forwarded electronically and during the Symposium to familiarize users with the instrument.
- Funded projects include a Sustainability Plan to continue program efforts and support for STEM achievement and teaching promoting STEM careers (Outcome 2.2 and 2.4)
 - Challenger Center Missions for High Schools have established a network internally to NASA and externally to accomplish project goals as well as secure invest in the project beyond its funding period
- Increase use of technology in the classroom using NASA resources increasing the access nationwide for educators and students.
- Technical Advisors have been identified for projects to assist them in navigating throughout NASA and identifying resources to meet the needs of the project. (Outcomes 2.1, 2.2, 2.3 and 2.4)

- Online Learning Communities is being used by Students Preparing to Advance into Careers in Engineering (SPACE). The Challenger Center Missions for High School is incorporating online activities, interactive activities and digital data logs. *Georgians Experience Astronomy Research in Schools* (GEARS) training educators how to use electronic tools and the curriculum teacher workshops is being posted electronically. New Frontiers: Journeying to Mars with Interactive Technologies is using new technology, iPad, portable social media and iPhones.
- Increase use of NASA resources by educators and students (Outcome 2.3)
 - Challenger Center Missions for High School engaged educators and students in activities using NASA resources in the classroom.
- Maximizing use of NASA facilities, scientist, engineers and education employees. (Outcome 2.3)
 - Eyes in the Sky identified Goddard Space Flight Center (GSFC) scientist, engineers as well as facilities deliver NASA content to educators. Virginia Aerospace Scholars utilized Langley Research Center (LRC) facilities and employees to provide engaging experiences for students. Johnson Space Center resources were utilized by Challenger Center Missions for High School. National Commission on Teaching and America's Future has maximized use of available resources to include the Educator Resource Center.
- Underrepresented/underserved students are being expose to NASA mission science (Outcomes 2.1, 2.2, 2.3 and 2.4)
 - Projects include NASA mission science from Earth and Space Science, Challenger Center Missions for High School, Georgians Experience in Astronomy Research in Schools (GEARS), New Frontiers: Journey to Mars using Interactive Technologies and Eyes on the Sky.
 - Students Preparing to Advance into Careers in Engineering (SPACE) and Virginia Aerospace and Technology Scholars (VASTS) are engaged in robotics activities and challenges.
- Increase use of NASA astronomy resources in the curriculum (Outcomes 2.2 and 2.3)
 - Georgians Experience in Astronomy Research in Schools (GEARS) is creating a comprehensive curriculum/program in astronomy for high schools in the state.
- NASA resources included in graduate level courses for educators (Outcome 2.3)
 - Georgians Experience in Astronomy Research in Schools (GEARS) in collaboration with Georgia Southern University is offering teachers graduate level courses using NASA resources.
- Use of undergraduate students pursuing STEM careers as mentors for underrepresented groups (Outcome 2.4)

- Students Preparing to Advance into Careers in Engineering (SPACE) engage undergraduate students from underrepresented groups to serve as role models to inspire students to pursue STEM careers.
- Provided learning experiences for parents to support career development in STEM fields (Outcomes 2.2, 2.3 and 2.4)
 - Students Preparing to Advance into Careers in Engineering (SPACE) provides virtual scientific and technological built around Online Learning Communities experiences for underrepresented students, teachers and parents year round.
- Projects recognized within state for contributing to STEM education (Outcome 2.4)
 - Virginia Aerospace and Technology Scholars (VASTS) received recognition from the Governor for the project's contributions in STEM education.

Project Contributions to PART Measures

The K-12 CAN was developed to offer a competitive opportunity to external organizations to improve STEM instruction and achievement. The K-12 awards are aligned with Outcome 2 of the NASA Education Framework and contribute to accomplishing the PART measures. The available data in the Office of Education Performance (OEPM) system indicate that the awards are supporting the objectives of NASA Education and positively contributing to Outcome 2.

- 2.1 Educator Professional Development – Short Term
 - 773 educators participated in short duration education experiences
- 2.2 Educator Professional Development – Long Term
 - 492 participated in long duration training programs
- 2.3 Curricular Support Resources
 - 1230 educators used NASA resources in classroom instruction
- 2.4 Student Involvement K-12
 - 3821 students involved in NASA instructional and enrichment activities

Data supporting Outcome 2 and Part measures is continuously being input into the OEPM system.

Quarterly, annual and final evaluations are submitted by awardees allowing continuous monitoring and feedback.

The K-12 CAN is a critical investment to ensure NASA content is incorporated in STEM programs at the high school level to improve student learning and instruction. Funded

projects include a Sustainability Plan to continue program efforts and support for STEM achievement and teaching promoting STEM careers.

Improvements Made in the Past Year

- Identification of ample reviewers to provide for a smooth and efficient review process
- Identified Panel Reviewers with experience/expertise in K-12 STEM education
- Collected program data through the new Office Education Performance Management system
- Established theme committees, technology, professional development and student learning for awardees to increase networking opportunities, positively impact project visibility and increase success. Increasing awardees opportunities to network, dialogue about project and the possibility of connecting to a resource or another project out of their service area.
- Bi-monthly telecons are scheduled to increase synergy, stay abreast of projects and work through challenges together
- Annual Symposium in May increased to 2 days
- Awarded projects are invited to present project overviews to the GSFC Education Public Outreach (EPO) community when in the area.
 - New Frontiers: Journeying to Mars with Interactive Technologies provided a detail overview of the project to the GSFC EPO community which provided a good exchange of ideas and feedback useful to both groups. The project is being piloted locally with underserved/underrepresented groups in local schools allowing the National Project Leader to engage in a dialogue with educators and receive their feedback.

Project Partners and Role of Partners in Project Execution

Many awards established partners to support the projects during the funded period. These partners are encouraged and have investments in the project increasing lasting relations, ownership and increased sustainability. Several NASA Centers have partnered with a project and one has shown their support by adding additional funding.

Project partners are encouraged to increase the sustainability efforts for each award. Each individual award is encouraged to identify partners in the Sustainability Plan. To strengthen relationships, it is suggested that each awarded project make a connection to their state STEM initiatives coordinators and/or school districts.

Partners have been established with area college/universities and school districts in the state Partnership examples include the following:

- **Virginia Aerospace and Technology Scholars (VASTS)** has partnered with Langley Research Center (LRC) and received additional funding from LRC for 2 consecutive years showing their support of the project.
- **Challenger Center Missions for High School** partnered with specific NASA programs to ensure program delivery as well as the Lunar Science Institute.
- **Students Preparing to Advance into Careers in Engineering (Space)** established a consortium to include the University of North Carolina-GA and the North Carolina Mathematics and Science Education Network.
- **New Frontiers: Journeying to Mars Using Interactive Technologies** has partnered with the District of Columbia Public Schools.
- **National Commission on Teaching and America's Future** established viable partnerships with Howard County Public Schools and Prince George's County Public Schools in Maryland to ensure to institutionalized within school systems beyond funding years.