

EDUCATION FLIGHT PROJECTS (EFP)

Administered by Oklahoma State University (OSU)

Type of Agreement: Teaching From Space Cooperative Agreement

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PROJECT DESCRIPTION

In FY09, the scope of Education Flight Projects (EFP) expanded when it absorbed the functions and activities of the Educator Astronaut Project (EAP). The integration of the two projects under EFP resulted in a more diverse and dynamic project, equally focused on offering unique NASA experiences to educators and their students.

EFP involves K-12 students and educators in hands-on experiences and research applications on-board a variety of NASA flight platforms and in NASA ground-based facilities. The project is national in scope and involves both formal and informal education communities and other NASA Education projects. The project's strength is its capability to highlight the Agency's missions and connect education audiences to NASA content, people, and facilities.

EFP offers opportunities for educators and students to actively participate in NASA missions on the Space Shuttle, the International Space Station (ISS), and other NASA flight platforms or through hands-on experiences at NASA Center laboratories and test facilities. These diverse experiences are intended to inspire, engage, and educate K- 12 students and their teachers and offer them unique NASA-related science, technology, engineering, and mathematics (STEM) content and resources.

EFP recognizes that well-trained and highly motivated educators are essential to increasing student interest and achievement in STEM. The project provides short and long duration educator professional development, both face-to-face and electronically. EFP sees value in providing educators non-traditional professional development by taking them out of the classroom and offering real world experiences. The project gives educators rich opportunities to interact and work with personnel at NASA Centers and to use the Agency's exceptional resources. In FY09, EFP professional development activities utilized multiple NASA facilities and flight platforms including the reduced gravity aircraft; a NASA atmospheric research aircraft; and a microgravity drop tower.

EFP student activities are diverse and incorporate NASA-specific STEM content and highlight on STEM-related careers. These activities allow students to engage in NASA missions through hands-on and authentic experiences. In FY09, students took Earth photographs from the ISS; interacted real-time with ISS and Space Shuttle crews; participated in a lunar plant growth chamber engineering design challenge; sent their signatures to space; and launched rockets to approximately one mile above the ground.

EFP seeks to continually increase and improve its portfolio of ground-based and on-orbit education activities. In FY09, the project issued an internal call for proposals with the intent to fund development of new or expand the scope of existing education flight activities. Ten activities based at nine NASA Centers were funded and became part of the EFP portfolio. EFP recognized the need to create a "one-stop shopping" web site for educators and students interested in the project's activities. In FY09, the project launched a comprehensive education web site (www.nasa.gov/education/tfs) that showcases diverse NASA education flight activities. The site provides educators and students access to multiple flight opportunities, allowing them to participate in the pipeline of NASA education activities.

The project coordinates on-orbit education activities including payloads and demonstrations on both the Space Shuttle and the ISS. These on-orbit education activities are used to create resources for educators and students. EFP is also responsible for the design, development, and execution of comprehensive long-term national education plans associated with specific Space Shuttle missions, particularly those on which an educator astronaut flies. In FY09, EFP had overall responsibility for the STS-119 education plan that included pre-mission, mission, and post-mission components.

EFP continues to support the development and implementation of the ISS National Laboratory. As NASA continues to develop the next generation of space vehicles, EFP works with Program Offices to ensure that there are opportunities to continue to implement existing and develop new education flight activities.

PROJECT GOALS

EFP is focused on increasing K-12 student interest and achievement in STEM. The project achieves this goal by offering unique NASA experiences to students and educators. Recognizing that hands-on, interactive, authentic experiences are effective learning tools, EFP provides the Agency with rich opportunities to inspire, engage, and educate the Nation's students and educators. Student and educator participation in NASA-unique education flight activities directly contributes to NASA Education efforts to attract and retain students in STEM disciplines and strengthen NASA and the Nation's future workforce.

The vision for EFP is to: *Facilitate education opportunities that use the unique environment of spaceflight and other flight platforms.*

The project will meet the following objectives:

1. Develop and provide NASA-unique experiences, opportunities, content, and resources to educators to increase K-12 student interest in STEM disciplines.
2. Develop and facilitate NEAT-like group of highly motivated educators. (NEAT – Network of Educator Astronaut Teachers)
3. Build internal and external partnerships with NASA Program Offices and formal and informal education communities to create unique learning opportunities and professional development experiences.

PROJECT BENEFITS TO OUTCOME 2

EFP goals align to Outcome 2 in the 2006 NASA Education Strategic Coordination Framework (www.nasa.gov/offices/education/performance/strategic_framework.html). EFP directly contributes to: *Outcome 2 – Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty.* EFP reaches K-12 educators and their students through real-world, hands-on, and interactive education flight activities. The project offers experiences that focus on STEM disciplines and highlight NASA missions, content, and careers. The project collaborates with other NASA Education projects, Mission Directorates, Center Education offices, and external partners to increase the value and scope of these activities.

EFP activities offer NASA Education outstanding opportunities to implement recommendations from the National Research Council's (NRC) Review and Evaluation of NASA's Precollege Education Program Project activities are NASA unique and "capitalize on NASA's primary strengths and resources" including "the agency's scientific discoveries; its technology and aeronautical developments; its space exploration activities; the scientists, engineers, and other technical staff (both internal and external) who carry out NASA's work; and the unique excitement generated by space flight and space exploration." (Reference: 2008 NRC Report (www.nap.edu/catalog.php?record_id=12081).

In FY09, EFP significantly contributed to Outcome 2 by promoting increased educator and student involvement in education flight activities. The project encourages participants to use these high visibility experiences to increase the number of educators and students, the media, the community, families, and legislators involved in NASA missions. The project is innovative, continually seeking new ways to improve and enhance the value of project activities and incorporate current trends in the use of multi-media and new technologies to engage greater numbers of educators and students. Because many EFP activities are dependent on mission operational requirements, the total number of participants may vary each fiscal year.

The project continually evaluates its activities to insure that they are effective and successfully support Outcome 2. EFP works with each project activity to improve its individual contributions to Outcome 2. EFP provides guidance on requirements, expectations, and data collection, which result in increased benefits to Outcome 2.

PROJECT ACCOMPLISHMENTS

The EFP FY09 project plan listed expected major project tasks and milestones for the year. The project accomplished the following tasks identified in the plan:

- Established new cooperative agreements with Oklahoma State University (OSU) for Teaching From Space and Sally Ride Science for ISS EarthKAM
- Developed a plan for the redesign of the NEAT based on the recommendations from the FY08 external NEAT benchmarking study
- Designed and launched three new education websites, including a project website that serves as a gateway to existing flight projects, project descriptions, and contact information
- Continued to lead Agency efforts to use the flights (STS-119) of educator astronauts as extraordinary opportunities to inspire and engage both educators and students by developing both a national education and promotion plan
- Released an internal call for proposals in FY09 to identify potential partnerships with Agency education flight projects, specifically those that provide educator/student hands on experiences, participation, and research applications on-board NASA flight platforms
- Established a committee comprised of Amateur Radio on the ISS (ARISS) major stakeholders to improve communications, define roles and responsibilities, and increase education; hosted ARISS education meeting at Johnson Space Center; lead education meetings at the ARISS International meeting
- Expanded opportunities to “push-pull” to and from other NASA K-12 and eEducation projects; increased the ability of EFP to leverage and integrate resources across the NASA Education portfolio
- Completed a record number of on-orbit education demonstrations that result in video used in the development of education activities and resources
- Completed all requirements for the manifest and launch of an ISS education payload; the payload contains demonstration items to be used in education demonstrations and downlinks
- Partnered with Channel One News on an education downlink during STS-119; downlink reached an estimated audience of 150,000 educators and 6 million students
- Partnered with Lockheed Martin on Signatures in Space; 550,000 student signatures were sent to space
- Worked with ISS International Partners and NASA Public Affairs Office to develop a selection and implementation process for international education downlinks
- Worked with NASA Public Affairs Office, Behavioral Health Program (ISS crew), and the Astronaut Office to produce a policy document for ISS crew discretionary events

PROJECT CONTRIBUTIONS TO PART MEASURES

PART Measure (short duration professional development) – Percentage of elementary and secondary educators who obtain NASA content-based resources or participate in short-duration NASA education activities and use NASA resources in their classroom instruction.

Through short duration professional development experiences, EFP reached a total of 20,703 educators. Of that total number, 7978 educators' primary NASA relationship is with another K-12 project. This overlap reflects EFP's synergistic connection with other projects and its strong commitment to serving both internal and external audiences.

PART Measure (long duration professional development) – Percentage of elementary and secondary educators who participate in NASA training programs and use NASA resources in their classroom instruction

Through long duration professional development experiences, EFP reached a total of 287 educators. Of that total, 76 educators had a primary NASA relationship with another K-12 project. This overlap reflects EFP's ability to provide rich and valuable extended professional development for educators both connected with and outside of NASA K-12 projects.

PART Measure (Students) – Number of elementary and secondary student participants in NASA instructional and enrichment activities

In FY09, EFP reached 775,148 K-12 students. Of that total number, 37,767 students were already involved in other NASA K-12 projects. This overlap reflects the value of the EFP portfolio in supporting the goals and objectives of K-12 projects that reach students.

IMPROVEMENTS MADE IN THE PAST YEAR

In FY09, EFP management completed the full integration of EAP and EFP. This integration resulted in more efficient and effective approach to project management, processes, budget oversight, and evaluation. This year, traditional EAP activities were incorporated into EFP, resulting in increased opportunities for educators and students to become involved in NASA missions and flight projects. The EAP project name is no longer used.

A primary task under EAP was the redesign of the NEAT. Recognizing that all NASA K-12 and eEducation projects could potentially benefit from a NASA network of educators, EFP expanded the vision and has involved these projects in the development of a community of educators.

EFP continues to develop and refine models for the project. Building on the successful limited internal call for proposals in FY08, the project released two calls in FY09, one in 2nd quarter for FY09 activities and another in the 4th quarter for FY10 activities. Processes for the selection of new education activities continue to be improved. EFP created a strong model to design and implement a national education plan related to selected Space Shuttle flights. For STS-119, the project cut development and implementation time from 18 months to 6 months with the use of this model.

EFP strives to improve evaluation strategies and to efficiently and effectively collect data from its geographically diverse portfolio. The project assesses processes related to metrics and seeks input from evaluation experts in an effort to continually improve its contributions to Outcome 2.

EFP continues to work to improve communication within its portfolio, with NASA Center Education Offices, and with identified EFP points of contact at each Center. The project successfully established regular communication with activities, Centers, and held two face-to-face meetings with EFP points of contact. EFP management worked with Elementary-Secondary project managers to hold EFP meetings in conjunction with other project meetings, minimizing travel costs. Center points of contact contribute to project tasks, promoted project activities, and provided input to mid-year and year-end data collection.

EFP recognizes that educators and students may have difficulty locating NASA education materials and resources. To improve educator and student access to NASA materials, the project developed three new web sites in FY09. Using a "one stop shopping" approach, the web sites house materials on certain topics in one location. EFP completed development of a web site to promote project activities, and two additional web sites, DIY Podcast (www.nasa.gov/education/diypodcasts) and Spacesuits (www.nasa.gov/education/spacesuits).

In FY09, EFP identified new and innovative ways to use on-orbit education video as part of a variety of education resources. The project began development of a "day in the life" video collection that highlights living and working on the ISS which will be housed at the project website. With the creation of the DIY Podcast site, students and educators can now use on-orbit video to create their own podcasts. Three new opportunities to use on-orbit video in education materials and activities were identified at three NASA Centers (Kennedy, Langley, and Stennis) through the EFP call for proposals.

PROJECT PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

EFP management works closely with Oklahoma State University (OSU), through the Teaching From Space (TFS) Cooperative Agreement (#NNX09AC24G), on all elements of the project. OSU provides the highly skilled TFS staff that is responsible for daily EFP operations. OSU supports major project initiatives as well as the continuous evaluation of the project's activities.

EFP recognizes that partnering with other NASA Education projects and activities is mutually beneficial and has the potential to increase the worth and reach of all associated projects and to result in enhanced continuity between NASA Education portfolio elements. The project also seeks opportunities to work with NASA Center Education offices and Mission Directorates to develop and deliver EFP activities. The project works closely with appropriate NASA Program and Project Offices, to identify flight opportunities, and content for and subject matter experts to participate in the project's activities. EFP also collaborates with external education organizations to expand the scope and value of its activities. Key internal and external partners in FY09 included: Channel One News, U.S. Department of Education, NASA Explorer Schools (NES), Science, Engineering, Mathematics and Aerospace Academy (SEMAA), Canadian Space Agency (CSA), Japan Aerospace Exploration Agency (JAXA), National Science Teachers Association (NSTA), STARBASE, Challenger Centers, NASA Digital Learning Network (DLN), Lockheed Martin, National Air and Space Museum, Boy Scouts of America, and Space Center Houston.