

Virginia Air and Space Center Education Programming and Outreach
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PROJECT RESULTS

The Virginia Air & Space Center (VASC) provides a high quality aerospace public education program to engage students, teachers, and the general public, through NASA-inspired programming. This mission is accomplished through a comprehensive offering of age-specific education programs, science camps, public lectures, family activities, teacher workshops, tours, exhibits and demonstrations aligned with Virginia's Standards of Learning (SOL), National Science Education Standards (NSES) and NASA education objectives.

VASC strives to infuse NASA content into all programs as a way to provide experiences that are integral components of a broad-based science, technology, engineering and math (STEM) education. VASC has hired an educator to serve as liaison with NASA Langley Research Center's (LaRC's) Office of Education. The NASA Educator in Residence (EIR) integrates NASA content into VASC programming for the purpose of inspiring and educating students at all levels to pursue careers in STEM. The NASA EIR also works with LaRC's Informal Education Manager to disseminate current NASA mission information and newly approved NASA educational content to other informal education venues throughout LaRC's five state region. This includes locations in VA, WV, NC, SC and KY. The NASA Educator Resource Center (ERC) Manager works closely with the NASA EIR to coordinate efforts to provide formal and informal educators with NASA content.

A comprehensive series of education programs has been developed with LaRC's Science Directorate and LaRC's Office of Education designed to raise awareness of the science of climate change and NASA's unique role in the acquisition and analysis of data. These education programs include a teacher professional development workshop, which is being offered multiple times throughout the year for formal and informal educators. This series also includes an after-school component, summer camps, K-12 field trips and a show-stopping outreach science demonstration. This demonstration will be presented at other museums and informal settings throughout LaRC's five state region. A touch screen tabletop traveling exhibit is being developed to enable participants to explore the science of climate change and the potential impacts on their daily lives.

VASC is also incorporating engineering challenges related to NASA's current and future missions to build experiences that demonstrate the relevancy of engineering to math and science, and to develop creative and critical thinking skills. By utilizing NASA engineering design challenges, the public is exposed to content from all four NASA mission directorates. This provides a comprehensive understanding of NASA's overall mission.

As NASA LaRC's Visitor Center, the Virginia Air & Space Center extends NASA's mission to "inspire the next generation" serving a total of over 400,000 people each year.

PROJECT GOALS

1. Expand the Visitor Center mission as a world-class facility devoted to science, aviation, space and technology through development of new educational programs, a Digital Discovery Lab and hands-on exhibits.
2. Play an aggressive role in involving students and the public with NASA content.
3. Improve the science, technology, engineering and math literacy of students, families and the public through hands-on, engaging activities that focus on STEM.
4. Encourage students to pursue career paths critical to NASA's future engineering, scientific and technical missions.

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

Outcomes 2 and 3:

The Virginia Air & Space Center has over 400,000 visitors per year. Over 200,000 of those are school-aged children who participate in NASA-inspired education programs.

Forty-one education programs and demonstrations were developed or revised and presented to 55,454 students in formal classroom settings on field trips or through outreaches to their schools.

Two hundred outreach activities were conducted to public and private schools, and public events. In excess of 50,000 students were hosted at these events. More than 1,000 science campers, 2,400 girls scouts and 1,200 boy scouts and 1,300 home school students and parents benefit from these educational experiences.

The exploratory, hands-on nature of VASC's programs and exhibits encourage a curiosity and a deepening of understanding that strengthen the connection between real-world and classroom lessons.

Twenty-five thousand underserved students (Title I) were given free admission to the museum through our Opportunity Fund. This fund is supported through corporate and private donations.

VASC conducts a 4-6 teacher professional development workshops per year on NASA related content. Over 200 formal and informal educators are served through these workshops. VASC often invites educators from other NASA centers to conduct workshops, providing center-specific content to be shared with teachers within LaRC's region.

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

Goal 1. VASC has expanded the Center's role as a world-class facility devoted to science, aviation, space and technology through development of new educational programs, a Digital Discovery Lab and hands-on space exhibits.

New or revamped programs for students from pre-K through adult learners have been created and incorporated into school field trips, camps, teacher workshops and special events such as NASA Engineering Day, 40th Anniversary of Apollo 12 and NASA Exploration Day for home schooled children. The education programs and the teacher workshops derive from the programs of NASA's mission directorates. This year new education programs emphasize global climate change and NASA's role in data collection and analysis, the engineering challenges of the Hubble repair mission and the science revealed in the Hubble images. Other education activities were related to the Lunar Reconnaissance Orbiter (LRO/LCROSS mission), the Orion Launch Abort System, the Lunar Electric Rover and the Inflatable Re-entry Vehicle Experiment (IRVE). LaRC engineers work on many of these missions and often participate in VASC activities where they engage students and the public. The museum's Mission Simulator was converted to a lunar/Mars landing experience. The simulator experience is designed to foster the teamwork necessary to achieve space missions. It is just one element of the Digital Discovery Laboratory which immerses participants in simulation of NASA experiences.

Goal 2. Play an aggressive role in educating students and the public with NASA content.

VASC has increased its outreaches to formal and informal venues. We conducted nearly 200 outreaches to public and private schools as well as public events underscoring NASA's missions. In partnership with LaRC's Informal Education Office, VASC reached thousands of visitors at Busch Gardens, the Virginia Living Museum, the NC Museum of Natural Sciences, The Williamsburg Regional Library, Norfolk Botanical Gardens, and other informal settings. We have also initiated work on a NASA related after school program. This program will be piloted regionally in the fall. The effectiveness of the program will be evaluated prior to and following implementation. This after school program will be both sustainable and replicable for the purpose of taking it to other locations in the future.

Educator Resource Center (ERC) hosted more than 50 presentations for formal and informal educators. The ERC manager also visited approximately 20 schools in the Hampton Roads area, many of which involved after school presentations to Cooperative Hampton Roads Organization for Minorities in Engineering (CHROME) clubs. VASC has an increasing involvement with CHROME clubs, allowing us to reach over 800 underserved and previously unreachable children.

Goal 3. Improve the science and technology literacy of students, families and the public through hands-on, educational activities that focus on STEM.

VASC initiated a summer engineering camp for girls to increase their comfort level and their interest in STEM. In addition, VASC has worked with LaRC to provide high school students an opportunity to learn about NASA's missions from LaRC scientists and engineers. These students then serve as mentors for middle school children at a NASA Exploration summer camp at VASC.

We have created dynamic programs such as the Lunar Sample Presentation to be delivered for lifelong learners, senior centers and retirement facilities. We made 31 presentations to groups at senior centers on the Apollo era and used lunar samples to let individuals hold a piece of the moon. This resulted in visits to the museum by eight of these groups.

VASC also hosts free monthly science lectures in collaboration with LaRC – the Sigma Series and numerous visits by astronauts for our visitors.

Goal 4. Encourage students to pursue educational disciplines critical to NASA's future engineering, scientific and technical missions.

VASC often invites NASA scientists and engineers to inspire students and increase student awareness of STEM careers that relate to NASA's programs. VASC's use of LaRC engineers and scientists in programs and special events (such as Space Day, Engineering Day, etc.) encourages students to pursue careers in STEM fields. The school field trips, after-school programs, and camps include a career component.

VASC is the official sponsor of the FIRST Robotics Competition (FRC) annual kickoff every year in January. All teams were invited to learn team-building “NASA style” in the Altair Lunar Lander mission experience. We have also invited the FIRST Lego League (FLL) to participate in events at VASC and specifically targeted their use of the Altair Lunar Lander and the Digital Learning Lab.

PROJECT CONTRIBUTIONS TO PART MEASURES (INCLUDE DATA PLUS EXPLANATION)

1. VASC reaches a total of 400,000 people annually.
2. Of the total visitors, 200,000 K-12 students.
 - 55,454 students are reached through school field trips and outreaches
 - 25,000 underserved students (Title I) were given free admission to the museum through our Opportunity Fund
 - 800 underserved students were reached through the CHROME after school program
 - 2,400 Girl Scouts participated in “Girls Rock-it,” “Techno-girl,” and summer camp events
 - 1,200 boy scouts attended VASC camps and education activities
 - 500 students participated in Digital Discovery Laboratory activities
3. Two hundred (200) formal and informal educators participated in NASA professional development workshops at VASC.
4. One thousand three hundred (1,300) home schooled students and their parents attended VASC education events.
5. Eight hundred (800) lifelong learners were served through VASC education events.

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

- The creation of the NASA Educator in Residence position has resulted in an increase in activities based on NASA content. The incumbent has many years of teaching experience and is leading many of the museum's special events, outreach activities and professional development workshops. Her main focus is to keep abreast of NASA's education content and to coordinate activities and events at the museum with NASA LaRC's Informal Education Manager. This extension of LaRC's Office of Education has resulted in much greater NASA presence in the museum's programs.
- The NASA Educator in Residence and the LaRC ERC Manager have proactively promoted the ERC by increasing the number of presentations at teacher conferences and at in-service training. The ERC has also been revamped and reorganized by content area making it more user-friendly. This has resulted in an increase of visits by 200%.
- The NASA Educator in Residence in partnership with educators at the Virginia Space Grant Consortium developed an engaging presentation on the science of climate change using the Magic Planet. This presentation was first used at the World Modeling and Simulation Conference held in Virginia Beach, VA. NASA Associate Director, Christopher Scolese, explored the exhibit during his visit to the MODSIM conference, and showed appreciation for the high level of engagement the presentation offered. This Magic Planet presentation is now used at the museum to engage K-12 students in the science of climate change. This presentation will also be used in museum outreach events and in the after school program.
- The newly created Lunar Sample Presentation has increase museum visitors and requests for outreach visits.
- Nineteen new interactive, permanent exhibit components were installed in the Space Quest Gallery.
- Attendance to VASC overnight camp-ins was increased 136% by Girl Scouts and home school children to our already robust Boy Scout program.
- Girl Scout events such as "Girls Rock-it" and "Techno Girl" were big hits with school-age girls. Twelve hundred girls attended each event. The participation of NASA role models including Center Director Lesa Roe, were key to the success of these events.

PROJECT PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

- Girl Scout Council Of Colonial Coast
- Virginia Association of Science Teachers – presentation at annual Professional Development Institute and booth in exhibit hall to introduce teachers to NASA resources and classroom activities. Teachers will VASC during the 2010 PDI.
- Virginia Junior Academy of Science – we judge student papers and host banquet
- Tidewater Area Science Teachers – member and supporter
- FIRST Robotics – we host annual kick-off event for area teams and further support FIRST Robotics through VASC programming and outreach activities.
- Home school Educators Association of Virginia – we have a long-term mutual relationship, they advertising our home school events and participation in same
- Home School Out-of-the-Box – we created and delivered to their students a 15-week course on robotics
- Southside Educational Escapades Home school Group – we created and delivered to their students a 15-week course on robotics
- Contracts with the following schools for outreach programs and field trips to VASC:
 - Hampton Roads Academy Lower School
 - Norfolk Academy
 - Nansemond-Suffolk Academy
 - York Elementary School
- Hampton City Schools – school programming – fifth grade & pre-K
- Newport News Public Schools – school programming – sixth grade & pre-K
- Beazley Foundation – submitted proposal for education programs for Portsmouth Public Schools
- VuBay Foundation – funding for education programs for Hampton Roads Schools' at risk students (Title 1 and Head Start)
- National Institute of Aerospace – NASA eClips and Virtual Worlds – advisory capacity - coordination to participate in VASC events
- Virginia Space Grant Consortium – Gear-up program and seat on Advisory Board, and coordination of Global Climate Change education program
- Langley Federal Credit Union – Corporate sponsorships for education programs