

Nomination Form

May 23, 2003 extension to deadline granted.

Title of Nomination: Challenger Learning Center - e-Mission: Space Station Alpha

Project/System Mgr.: Nancy Sturm
Job Title: Challenger Learning Center Education Director
Agency: Challenger Learning Center
Wheeling Jesuit University
Address: 316 Washington Avenue
City: Wheeling
State: West Virginia
Zip: 26003
Phone: 304-243-2377
Fax: 304-243-2086
Email: sturm@cet.edu

Category for judging: **Innovative Use of Technology**

Person Nominating: Chaed Smith
Job Title: Senior Technology Officer, Governor's Office of Technology
Address: 505 Capitol Street
City: Charleston
State: West Virginia
Zip: 25301
Phone: 304-558-3784
Fax: 304-558-0136
Email: csmith@wvgot.or

NASCIO RECOGNITION AWARDS

EXECUTIVE SUMMARY

Many children dream of exploring Space. The Challenger Learning Center brings that dream to life. When classes of students visit a Challenger Learning Center, they climb aboard a space station, conduct scientific experiments, and work together to solve problems. During e-Mission: Space Station Alpha, students help Mission Control guide the Astronauts through a dangerous solar storm. The Space Station's electrical systems, life-support systems, and communications systems are jeopardized. The Astronaut's lives are threatened. Will the student Mission Specialists successfully manage the Space Station's technology and protect the Astronauts?

With one Internet hook-up and three computers, this program can be conducted in classrooms in the most remote locations across North America. The number of missions available is unlimited. The program can reach into every middle school and high school in North America. Developed by the Challenger Learning Center at Wheeling Jesuit University, e-Missions offer teachers and students a chance to use their classroom technology in new ways. Science teachers, educational researchers, and subject matter experts designed the programs. Teachers and students from Boston, Mass., and Charleston, West Virginia, to Anchorage, Alaska have tested and enjoyed them.

“E-Mission: Space Station Alpha” is an internet-based, engineering and design curriculum supplement for high school students. Students engaged in Space Station Challenge activities learn about new and emerging technologies in science and technological fields that did not exist five or ten years ago. This site challenges students to experience International Space Station design, construction, assembly, and operational processes.

This program is an innovative way to engage students with the power of math and science in real-time situations. During the mission, students connect live with a flight director at the Challenger Learning Center in Wheeling, WV. With the help of computers, the Internet and a small video camera, students interact with Mission Control to track the solar storm, monitor orbital position, predict radiation levels, study oxygen levels, and divert power to life support systems.

Students join one of four teams:

- 1) Storm Team: Solar tracking and orbital monitoring
- 2) Radiation Team: Radiation monitoring and shielding
- 3) Life Support: Environmental monitoring and astronaut health
- 4) Mission Operations (Ops): Electronics systems, power generation

To participate in a mission, students must first complete classroom activities to demonstrate their knowledge of science and math. On mission day, students serve as specialists to examine data, analyze it, and make their recommendations to Mission Control. Flight directors consider the students' advice and guide them toward successful solutions.

Throughout this problem-solving process, students apply math to integrated science topics, including biology, chemistry and physics. “Space Station Alpha” was designed by science

teachers, educational researchers and subject matter experts. The program is equivalent to five units of science and math curriculum (10 days) aligned with state and national standards.

The State of West Virginia is specially proud of this project because through grants from State business partners like Verizon and Appalachian Power Company, they have developed a program that is self-sustaining. They now charge other school systems for the license fee as well as a royalty fee and they use the income to continually improve the program and fund other e-Missions.

For more information about “Space Station Alpha,” contact Wheeling Jesuit University’s Challenger Learning Center or visit www.wju.edu/clc/ssa.

Written justification:

A) Description of Project, including length of time in operation

“E-Mission: Space Station Alpha” is an internet-based, engineering and design curriculum supplement for high school students. Students engaged in Space Station Challenge activities will learn about new and emerging technologies in science and technological fields that did not exist five or ten years ago. This site challenges students to experience International Space Station design, construction, assembly, and operational processes. The development for the pilots started in mid-2001. To date there have been over 30 missions conducted, as well as teacher training and flight director training. The embedded assessment has been designed and a web site has been developed. Other entities are providing funding for missions in the coalfield areas of the state.

B) Significance to the improvement of the operation of government

“Space Station Alpha” is an interactive method for teachers to effectively utilize technology in the classroom. Research indicates that this way of learning leads to improved problem-solving and critical thinking skills and teaches students the importance of teamwork and communication.

The Challenger Learning Center is committed to improving the quality and scope of interactive distance learning programs now available to West Virginia teachers and students. By delivering this program to classrooms across the state, teachers have the opportunity to learn and acquire skills needed to engage and motivate students while improving their teaching strategies. Students gain access to innovative, highly interactive distance learning content.

C) Benefits realized by service recipients, taxpayers, agency or state

Students participate in a simulated “mission” in which they serve as experts or specialists to solve real-life problems associated with emergency events. They participate in several weeks of classroom work, and take part in a live mission in which they link up with the Challenger Mission Control via the Internet. To accomplish a mission, the Challenger Learning Center at Wheeling Jesuit University partners with teachers and students who serve as emergency response teams during the simulation. Mission day begins with a space shuttle launching. Within moments, a crisis begins to happen. Students receive real-time data about an area where an emergency might happen. In a 90-120 minute time frame, students rally to analyze the data and determine the risks. Throughout the mission, Challenger Mission Control is live and in constant contact visually and via chat window over the Internet.

**D) Return on investment, short-term/long-term payback (include summary calculations)
Projects must exhibit measurable operational benefit.**

The mission of the Challenger Learning Center is to engage young people in motivating and meaningful learning that can assist them through their developmental years, to advance learning and foster profound changes in the nature of learning, teaching, assessment, and learning environments through the intelligent use of technology-based curricula.

The Challenger Learning Center is currently beta testing their framework for embedded assessment using pilot-test subjects in three “coalfield” areas of the State. These counties are Mingo, McDowell and Wyoming. This pilot project would also allow the program to test their materials in a special-needs context for maximum impact in the future.