Implementation Plan for Student Spaceflight Experiments Program (SSEP)
Mission 1 to the International Space Station
http://ssep.ncesse.org

Community: Charles County Public Schools (CCPS), Maryland

Proposed SSEP Community Program Director/Co-Directors:
Scott Hangey-Director of Science Instruction and Program Development, CCPS
301-643-8805 shangey@ccboe.com
Christine Smith- Instructional Specialist for Science, CCPS
301-643-3437 csmith@ccboe.com

1. Community Overview

Charles County Public Schools is one of the fastest growing school systems in Maryland. Located south of Washington, D.C., Charles County is considered part of the Washington, D.C. metropolitan area. The County also has the unique position of being in the center of the Mid-Atlantic Technology Corridor. Charles County has a population of 133,049 and is located in Southern Maryland. Charles County Public Schools, which services approximately 27,000 students, is composed of 21 elementary schools with students from prekindergarten to grade five; 8 middle schools with students from sixth to eighth grade; 6 high schools with students in grades nine through twelve; and 4 centers with students from pre-K to adult. Demographically, the student population is made up of 51.5% African Americans, 34.8% White, 5.1% Hispanic, 3.1%, Asian Pacific Islander, 4.8% Multi-Racial, and 1% American Indian/Alaskan. Thirty percent of our students receive free/reduced lunch.

2. Our Strategic Goals in STEM Education

With Charles County's location in the center of a regional technology corridor and the aging of our STEM workforce, Charles County has a goal of attracting and preparing students at all educational levels to pursue STEM coursework; supporting students to pursue postsecondary degrees; providing students and teachers with STEM related growth and research opportunities; and expanding the capacity of the school system to promote STEM education. Programs have been developed and implemented by the school system at all grade levels to meet these goals. Some examples of these programs include transdisciplinary curricula, Gateway and Project Lead The Way classes found in every middle school and high school with the high school program expanding to include more students, lessons co-taught by a scientist or engineer, and programs in which robotics and Chesapeake Bay issues introduce the use of technology with science and environmental issues.

In partnership with the Space Foundation, Charles County Public Schools has put into place professional development for teachers to increase their knowledge and application of space and aerospace technologies. This provides them a good foundation to become more comfortable with

fundamental space and aerospace concepts allowing them to not only share their knowledge with their students, but also their enthusiasm for aerospace engineering. SSEP can support the school system's vision by engaging students in authentic scientific thinking and problem solving as they become scientists in this historic endeavor.

3. Our Experience with SSEP on the Final Flight of Space Shuttle Atlantis (STS-135)

Charles County Public Schools participated in the Student Spaceflight Experiments Program (SSEP) on the final flight of the U.S. Space Shuttle Program, the flight of STS-135. Our students, teachers, parents, and educators were so excited to participate in such a historic event. There were 18 proposals submitted that involved 196 students from elementary, middle, and high school levels. Excitement about working as a scientist with the payoff of having their experiment fly aboard the space shuttle Atlantis was more than anyone could imagine happening for a student in Charles County, Maryland. A committee involving members from the community narrowed the field to three proposals that were then sent to NCESSE to determine the final experiment that would fly. With great anticipation the winning proposal was announced at the Charles County Public Schools SSEP Symposium that was held on June 1st where community members assembled to hear the final three proposals and view the mission patches that had been created. At the end of the evening the winning proposal and patch would fly aboard the shuttle were announced.

Our accomplishments…….

- 196 grades 5-12 students were immersed in real flight experiment design, with 18 student teams formally submitting flight experiment proposals
- Increased excitement for the space program as judged by community, principal, teacher and student comment
- Students excited about working as real scientists
- Students' engagement because of the possibility that their experiment could fly aboard the space shuttle
- Community leadership excited about students' participation in the program; County Commissioners along with members of the Board of Education attended our SSEP symposium
- Students whose project flew aboard Atlantis were ecstatic about the opportunity to participate in all of the events that have surrounded this experiment.
    - They have traveled to Florida to see the Launch.
    - They have traveled to the University of Richmond to perform the analysis of the experiment.
    - They have shared their pride and joy about participating in such a historic event as they have been interviewed by television news reporters and newspaper reporters. The team has been invited to speak at COMREL and other local community groups.
    - In July 2012, these students will be attending the Conference that will be held in Washington, DC sponsored by NCESSE.
- Extending the community experience to art and design, forty-six mission patches were judged, and one selected for flight, out of hundreds that were submitted at the school level

- Our superintendent supported the winning patch artwork by funding the creation of an actual patch which was distributed to all participating students, teachers and principals
- Our participation garnered media attention for STEM education in Charles County, including an article at NASA.gov:

  http://www.nasa.gov/audience/foreducators/charles-county-md.html
  http://www.wjla.com/articles/2011/07/charles-county-students-send-experiment-to-space-on-nasa-shuttle-63176.html

  http://www.somdnews.com/article/20110617/NEWS/706179851&template=southernMaryland

  http://somd.com/news/headlines/2011/13822.shtml

  http://www.thebaynet.com/news/index.cfm/fa/viewstory/story_ID/22385

Lessons learned and enhanced goals for our proposed participation in the new flight opportunity SSEP Mission 1 to ISS:

- Notification to principals and teachers at the start of school year which in turn will get the students involved at the beginning of the school year with the intent of having more proposals submitted
- Increased competition and increased number of students directly involved in the experiment design, proposal writing, and mission patch creation
- Timeline given to everyone at beginning of school year.
- More involvement from community members to support our students as they design their experiments and write their proposals.

4. Proposed Implementation and Scope for SSEP Mission 1 to the International Space Station

The Charles County Public Schools (CCPS) proposes to participate in the Student Spaceflight Experiments Program (SSEP) Mission 1 to the International Space Station during the 2011-12 academic year. Each school in Charles County has a staff member who fulfills the responsibility of STEM liaison; these teachers will serve as our point of contact within each school. These teachers will receive training on the parameters to create an experiment suitable to be flown on the shuttle and how they can document their teams' experiences. We will invite local scientists and engineering partners, to offer staff and students presentations related to the realities of experimenting in a space environment. Participants will have an opportunity to dialogue with these experts to further develop their interests, knowledge, and curiosity as they prepare for the competition. The students will be vying for use of an experimental slot reserved specifically for Charles County Public Schools aboard the International Space Station.

Following these informational sessions, students in grades 5-12 will be registered to participate in the SSEP individually or as part of a team. CCPS teachers will guide the participating students through various brainstorming and research gathering opportunities. Students will then decide on

the project and develop their proposal which will include the design of the experiment and the question to be addressed by the experiment. All proposals will be no longer than 5 pages. These proposals will be submitted to the Step 1 Review Panel. The Step 1 Review Panel will be comprised of local scientists, engineers, and educators. Members of the panel will carefully read and review the students' proposals. The student submissions will be evaluated using the formal proposal review criteria, and assign points to each section of the proposals. The Step 1 Review Panel will determine the three finalists based on the three highest scoring proposals.

This year, after conversation with 140 science teachers spanning grades K-12, we believe that we can more than triple the number of proposals submitted to 54 proposals. Based upon last year's average team size, this would mean that approximately 540 students, in grades 5-12, will be involved in the experimental proposal process.

A second phase of our plan involves a patch design competition that will also include students from grades K-12. These students will have the opportunity to create a mission patch that will travel on the International Space Station with the selected experiment.

Teachers were very excited to hear that for SSEP Mission 1 to ISS two winning patches will be flown aboard the space station. The ability to have patches from the elementary grades judged against each other and a separate judging for patches from students in grades 6—12 was viewed as another way to increase student participation. Dedicated science teachers at each grade level will coordinate the competition at their school. All patches will be on display at the Starkey Building allowing the general public to come in and vote for their favorite patch. There will be two patches selected: one from grades K-5 and one patch from grades 6-12.

Information regarding this historic opportunity will be presented at the opening school in-services for all science teachers on August 24 and 25, 2011. In addition, the information will be sent to all principals to share with their respective school communities through school websites, informational newsletters, and open house forums. Information regarding Charles County Public Schools participation in this event will be forwarded to our community partners from Naval Surface Weapons Center, Nav Air, Charles County Chamber of Commerce, ISTEM, and College of Southern Maryland.

The top three flight experiment teams will have an opportunity to present their proposal at the CCPS sponsored SSEP Symposium. The selected mission patches from each school will also be displayed at that time. The Symposium will be held at a CCPS high school for community members, parents, students, teachers, and administrators.

Additionally, the SSEP will be publicized through the Charles County Public Schools web page, local television channel 96, and the local newspaper. Once the mission is concluded, a mini-documentary will be created highlighting the students, teachers, and community members and their experiences through their role in this historic opportunity.

5. Budget

Charles County Public Schools would like to give our students the opportunity to return to space through the participation in SSEP Mission 1 to ISS. In order to accomplish this goal, the school system is seeking funding support that will allow our students to continue to experience working as a real scientists experimenting in a microgravity environment. The request for this funding is being made by our Superintendent, Mr. James Richmond, along with Mrs. Judy W. Estep, Assistant Superintendent of Instruction. Below is a chart showing our commitment to this program through in-kind matching funds.

Request: We are requesting: $19,950 in order to provide this opportunity in our community. The cost covers the basic cost of participation with SSEP.

Salary In-Kind Match:

Personnel	**Number of people**	**Number of hours**	**Pay Rate**	**Total**
Teachers	35	30	$34.00	$35,700.00
1 SSEP-CEP	1	55	$38.00	$2,090.00
STEM Coordinator	1	20	$38.00	$760.00
Director of Science	1	20	$45.00	$900.00
Transportation	65 (See note)			$4000.00
			Total	$43,450.00

Note: Note: Travel in July 2012, to SSEP National Conference at the National Air and Space Museum in Washington, DC, for top three flight experiment teams from STS-135 and ISS -1 Mission, and mission patch design competition.