

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

Community Consortium:

Pleasanton School District, Buffalo County, Nebraska
Norris School District, Lancaster County, Nebraska

Proposed SSEP Community Program Director/Co-Directors:

Alison Buescher, Educator, Pleasanton Public School, SSEP Director
308-388-2041, abuescher@esu10.org
Ron Wymore, Superintendent, Pleasanton Public School
308-388-2041, rwymore@esu10.org

Cindy Larson-Miller, PhD, Educator, Norris High School, SSEP Co-Director
402-791-0010, cindy.larson-miller@nsdtitans.org
Ryan Ruhl, Principal, Norris High School
402-791-0010, ryan.ruhl@nsdtitans.org

1. Community Overview

The Pleasanton School District consists of 153.4 square miles in Buffalo County, surrounded by Litchfield, Ravenna, Amherst, and Kearney Public Schools, respectively. Established in 1890, the Pleasanton School District is primarily rural residential, agricultural based, with many residents commuting to Kearney, Nebraska for employment. As the Buffalo County economy continues to expand, the Pleasanton population is expected to grow. Pleasanton’s Mission Statement emphasizes preparing students for the future: “Through cooperation of students, staff, family and community, the mission of Pleasanton Public Schools is to offer everyone educational opportunities to excel and become responsible citizens in an ever changing world.”

The Norris School District consists of approximately 230 square miles—about 40 lie in Gage County, 3 in Otoe County, and the remainder in Lancaster County. Nine small communities are within the boundaries of the Norris School District: Roca, Hickman, Firth, Cortland, Panama, Princeton, Holland, Cheney and Rokeby. The Norris District is bordered on the north by the Lincoln Public Schools, on the west by the Crete and Wilbur School Districts, on the south by the Beatrice, Freeman, and Tri-County School Districts, and on the east by the Bennet-Palmyra and Sterling Districts. The Norris School District is primarily rural residential, small town, and agricultural in nature. Many Norris residents are employed in Lincoln. As the Lincoln area continues to grow to the south and east, the population of the Norris District is expected to continue to increase steadily.

K-12 student enrollment figures for both Pleasanton and Norris districts are represented in the tables below.

Enrollment by Race

Student Enrollment 2009-2010	Pleasanton	Percent of Total	Norris	Percent of Total
White	209	94%	1916	94%
Black	0		20	1%
Hispanic	12	6%	66	3%
Asian	0		28	>1%
Native American	0		4	<1%
Total	221		2034	100%

Student Characteristics

Student Characteristics 2009-2010	Nebraska	Pleasanton	Norris
Free or Reduced Lunch	41.22%	35%	11.9%
SPED	15.26%	8.9%	9.99%
Mobility	11.89%	2%	3.48%
ELL	6.56%	0%	1.09%
Graduation Rate	89.85%	100%	100%
Attendance Rate	94.76%	93%	95.19%

Both school districts have increased their high school graduation science requirements from two (2) years to three (3). The graduation requirements include: Intro to Physics, Biology and Chemistry. In addition students can take Advanced Biology, Anatomy and Physiology, Differentiated and College Chemistry, and Differentiated Physics.

The 2010 – 2011 Pleasanton ACT Composite 20.7 while the current ACT Composite average for the 2011 graduates is 23.5. The Norris ACT composite science score is 23.7 the state’s composite science score is 22 and the national average science score is 20.9.

Both districts offer distance learning and online learning opportunities, which have opened the doors of learning for our rural-based student. In addition, students in both districts have the opportunity to complete dual credit courses, in which they receive both high school and college credit for their successful completion of the course. These options provide students with opportunities to prepare for their post-secondary experience within the safety of their home high school.

2. Our Strategic Goals in STEM Education and How SSEP Can Help Address Those Needs

The U.S. Department of Labor states that 15 of the 20 fastest growing occupations require significant mathematics or science preparation. The science curriculum is designed to provide students with science, math and engineering/technology in sequences that build upon each other. In response to the 2011 Nebraska State Accountability (NeSA) science assessment, Pleasanton

and Norris districts have taken a close look at the science curriculum and ensured that the curriculum is aligned to the state standards and build on STEM principles with each successive science course.

The SSEP program will greatly benefit our students by allowing them to experience in a hands-on, minds-on environment the world of Technology and Engineering. The experiment design opportunity that SSEP provides is the perfect framework for students to engage in the process and design that is engineering. This activity and life experience will reaffirm our message that STEM education is a way of thinking. Students will have the opportunity to apply core content knowledge in a personalized context, while helping them to develop critical thinking skills that can be applied to all aspects of their academic and personal lives.

The experiment design process and data collection will provide an invaluable opportunity for our students to have ownership of a “real” science experiment. Pleasanton and Norris are committed to incorporating technology in our students’ daily lives to enhance their learning experiences. Pleasanton School offers a 1:1 laptop program and both schools have been selected as recipients of a Wind for Schools grant that provides the school with a residential grade wind turbine. The wind turbine is used by students to investigate real world phenomena and provides an opportunity to objectively analyze data and apply content knowledge. We believe our students are future scientists, mathematicians and engineers, and the Student Spaceflight Experiments Program would provide Pleasanton and Norris students with the opportunity to increase their critical thinking skills, apply science concepts and engage our students in the active engineering process.

3. Proposed Program Scope

We are proposing that 350 students in grades 5 through 12 at both Pleasanton and Norris schools participate in SSEP Mission 1 to the International Space Station. There will be six (6) science and math teachers, (1) English teacher, (2) Technology teachers and two (2) administrators involved in the program. All 350 students will actively participate in the experiment design. Teams composed of 3-5 students will compile proposals for experimentation. This will result in 70-100 total proposals that will be evaluated before selecting the three proposals for final consideration. The entire student body population (2256 students) of Pleasanton and Norris Public Schools (K-12) will be invited to participate in the mission patch art and design competition. One patch will be chosen for each of the participating districts. Both districts will host a Community Science Night where all students will showcase their proposed experiments and mission badges will be on display.

Students will receive mentoring from staff educators as well as community career professionals. Outside leaders will include experts in the fields of engineering and technology. For example, student will receive mentoring, via Skype, from the lead design engineers at John Deere, as well

as interact with local scientists and researchers from local universities. English and technology classrooms will serve to produce a documentary chronicling the SSEP journey and will incorporate the experiment proposal into the writing curriculum. All students will receive guidance in composition and writing for their experiment proposals. English and composition students will report to the community on the progress of the science projects through the school website and newsletter. Students will complete a pre and post survey regarding their attitudes and beliefs toward STEM. We believe our schools' involvement in the SSEP program will positively impact our students' views of science, technology, engineering and math and reinforce the idea that these disciplines are intertwined. We believe involving the greater community in the SSEP process will increase the overall enthusiasm of our students, thus enhancing their educational experience.

4. Engaging the Local and Regional STEM Community

Our educational community will partner with leaders and mentors from local organizations, academia and industry professionals. Peg Abels, Director of Health Sciences at the University of Nebraska-Kearney (UNK), will present and discuss the advantages of a career in the field of Health Sciences as well as the benefits of attending a local university. UNK staff scientists and lecturers in the areas of Chemistry, Biology and Physics, as well as research and design teams for John Deere, will mentor student design teams in person and via SKYPE. Denise Waibel-Rycek, Nursing Educator for the University of Nebraska Medical Center Nursing Program-Kearney campus will visit PHS and discuss how STEM skills are vital for success in medicine. Students will also visit Good Samaritan Health System Campus for a behind the scenes view of STEM-related careers in medicine in our community. Our Community Review Board will include mentors from UNK, UNMC, industry professionals from our communities, as well as members of the Buffalo County Economic Development Committee.

Erika Volker of Partnerships for Innovation (PIF) has agreed to work with us and our communities in strengthening the understanding students have in Nebraska career opportunities. PIF hosts Nebraska Career Connections which is an online provider of educational and career planning resources that connect Nebraska students, parents, educators, adults, and employers. We believe that through this connection we can help students see that their future can remain in Nebraska and more specifically it can remain in the community in which they currently live.

5. Budget

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.

Matching funds: We are committing significant staff time to this effort, corresponding to a total of \$12,720. Details are provided in the Table below.

Staff	Number of staff	Hours	Fully Burdened Hourly Rate	Subtotal
SSEP Community Program Director	1	81	\$30/hour	\$2,430
Teachers	7	43 avg.	\$30/hour	\$9,030
Administrators\co-director	3	12 avg.	\$35/hour	\$1,260

Total Contribution from Pleasanton and Norris Public Schools.....\$12,720