

2007-2009 ETIC/OPAS GRANTS Program Abstracts

Health and Science High School, Beaverton School District

Using the engaging Project Lead the Way (PLTW) curriculum, we will enhance our HS academy programming for our pre-engineering students at tenth, eleventh and twelfth grades. We will also use the Gateway to Technology courses at the MS level and the Foundational courses at the HS level to prepare younger students for advanced courses at the upper grades, college success, and eventual success in engineering and applied science careers. As a new magnet/option school within the Beaverton School District, the Health and Science High School (HS2) has a unique opportunity to build a structure by grade level to meet a very specific and narrowly focused mission for our students. Two years in the planning and now in its first year of operations with 120 ninth graders, succeed in a wide variety of academic programs at the college level.

OSU SMILE Program

Through this project, The Science & Math Investigative Learning Experiences (SMILE) Program of Oregon State University (OSU) seeks to enhance pre-engineering and applied science education through after school, on-campus, and community-based educational experiences. The activities of this project are intended to expand the capacity of teachers, students, and their families to support the academic success, college readiness, and science, technology, engineering, and mathematics (STEM) career aspirations of educationally underserved middle school youth. The project targets youth who are minority, low-income, rural, and first-generation-in-college and is framed to connect these students to materials, experiences, role models, mentors, and college settings to make real the connections between aspirations, academics and careers.

This project also recognizes the critical role of families in the school success, college access, and career aspirations of youth. The project will provide substantial support for families to promote their involvement in and increased support of their children's science and mathematics learning and to increase families' awareness of the opportunities for and pathways to STEM careers.

Portland Community College

Portland and Mt. Hood Community Colleges, in partnership with the Manufacturing 21 Coalition, will host The Manufacturing Road Trip, a series of field trips for high school students to members of the manufacturing cluster in Oregon and to regional community colleges. These road trips are intended to motivate students and demonstrate career pathways, so that more students successfully transition from education institutions to the workforce. The road trips are also designed to educate teachers and counselors so that they can support student success in STEM related career pathways. In year one of the project, Portland Community College (PCC) will host groups from approximately five local high schools as they visit regional members of the manufacturing cluster in Oregon and PCC's Sylvania campus. In year two of the project, Mt. Hood Community College will perform similar tasks for local high schools in the Mt. Hood district. Students who participate in The Manufacturing Road Trip will also be encouraged to visit the NW Youth Career Expo, coordinated annually by the Manufacturing 21 Alliance, Portland Building Alliance, and the Oregon Building Conference.

Redmond High School, Redmond School District

The Students Pursuing a Career in Engineering (SPaCE) Project is designed to enhance the Engineering Academy at Redmond High School (RHS) by establishing course offerings in aerospace engineering, biotechnical engineering, civil engineering and architecture and by creating a middle school feeder program entitled Gateway To Technology®. In conjunction with Project Lead The Way®, RHS developed its Engineering Academy to provide an articulated pathway that prepares students for a successful transition into post-high school education and the workforce. The SPaCE Project will focus on increasing the interest of middle and high school students in engineering and applied science programs and on increasing the enrollment and success of females and minority students in engineering, mathematics, technology, and science courses. Students enrolled in courses created through the SPaCE Project will use inquiry methods and active learning to solve engineering problems in a team-based environment. The SPaCE Project seeks funding to create an Engineering Laboratory, to provide professional development for Engineering Academy instructors, to market the SPaCE Project and the Engineering Academy, and to recruit middle school and high school students interested in science, technology, mathematics, and engineering.

Salem-Keizer School District

This proposal will establish an engineering and applied science pathway from grades 6 through 12 in Keizer using curriculum provided by Project Lead the Way (PLTW). It will increase the number of students in the pathway, including females and minorities, through a variety of recruitment activities. It will provide teacher training as needed for middle school and high school staff in PLTW, a national engineering and applied science curriculum.

It will establish two labs for the Gateway to Technology course—one each at Claggett Creek Middle School and Whitaker Middle School—and establish or finish equipping labs for four PLTW classes at McNary High School: Introduction to Engineering Design, Digital Electronics, Principles of Engineering, and Computer Integrated Manufacturing. Recruitment strategies include an invention contest for grades 6 & 7, a science camp for grade 7, and a variety of presentations to parents and students in grades 6 – 10. Training will also be provided to school counselors so they can help students identify whether PLTW classes fit their needs and goals, and if so, where they should begin. It will provide post-secondary connections to Oregon State University, Portland State University, Oregon Institute of Technology, and Clackamas, Chemeketa, and Linn-Benton Community Colleges.

University of Oregon Material Science Institute

Since 2003, the Materials Science Institute's K-12 Science Outreach program has worked in 28 elementary and middle schools, with more than 220 teachers and thousands of kids. Working to improve science teaching in the classroom is crucial to the goal of increasing diversity of students pursuing degrees in engineering and applied sciences. Many students reached by our program will likely never attend an extra-curricular science program, due to a host of logistical issues, including poverty, location, awareness of programs, etc. The GK-12 program brings inquiry-based science directly to children, while providing them a scientist/role model by using graduate students in science to co-teach science kits with teachers. The program addresses sustainability by training teachers to use active-learning methods for science instruction after our program leaves the school. MSI has leveraged ETIC support in the past to obtain over \$3,380,000 in federal grant support through NSF and the DoE.

The long-term goal of the program is to change the way science is taught in Oregon's elementary and middle schools. To make this change, we are piloting this model around the state, building support from stakeholders, and working to have several districts adopt this curriculum and join into a shared science materials consortium during the next Oregon science adoption cycle, in 2009/2010. This project asks for support in setting up a shared science materials resource center in the Umatilla-Morrow Education Service District, while we partner with the Hermiston District to bring graduate outreach into each of the Hermiston Elementary schools.