

A) Project Summary

Oregon State University's SMILE Program requests funding for high-quality, STEAM programming in 9 mostly rural communities in Oregon for 200 underrepresented and underserved students in grades 4 and 5, and teacher professional development for 15 public elementary school teachers. STEAM programming is delivered through afterschool SMILE clubs, two regional College Connection events, two Teacher Workshops, Family Math and Science nights, and online resources. Programming aims to increase the number of underrepresented and underserved students who graduate from high school qualified to go on to college, and to pursue careers related to science, math, engineering, healthcare, and teaching. Impacts result from an increase in participants' science and math content knowledge, and the contextual knowledge necessary for college and career readiness. This project supports on-going partnerships with school districts, teachers, communities, university faculty and researchers, and other STEM/STEAM programs in Oregon.

B) Project Rational

SMILE supports STEAM programming at the following elementary schools: Evergreen (Three Rivers SD), Chiloquin (Klamath County SD), Dayton (Dayton SD 8), Nyssa (Nyssa SD 26), May Roberts (Ontario SD 8C), Siletz Valley (Lincoln County), Warm Springs (Jefferson SD 509J), Willamina (Willamina SD 30J), and Lincoln (Woodburn SD 103). Demographics for the current 156 students participating this school year are: 26% American Indian/Alaska Native, 31% Hispanic Origin, 26% White, 18% Multi-Racial/Multi-Ethnic; 87% Economically Disadvantaged; 47% First Generation to College; and 58% Female. All 156 students are from one or more underrepresented groups: high school graduation rates lower than the state average, low-income household, household with parents or guardians with an educational attainment level

of high school diploma or less, and/or have linguistic or cultural backgrounds different than those that predominate in Oregon's elementary school system. See tables in appendix for additional school and student details. Additionally, students must: demonstrate interest in math and science, exhibit good behavior, and receive grades of C or better in all classes.

There are substantial barriers that limit underrepresented students' abilities to persist in STEM programs and careers, and learning gaps appear early. Although many of the SMILE communities have STEM career opportunities, particularly related to natural resource management and healthcare, students from low-income families and groups underrepresented in STEM careers often do not have family members employed in these fields. Since 47% of this year's elementary school participants indicated that they are first generation to college in their family, they need college readiness support to help navigate towards college enrollment.

The afterschool clubs provide school enrichment for underserved students in an environment where they are treated as if they are going to college. SMILE incorporates strategies fostering engagement, persistence and achievement in students through experiential, contextual, and problem-based learning. SMILE's developmental framework is based on student needs. Specifically, what intrigues and motivates students, increases their sense of personal investment, and links to potential academic programs and career. This framework recognizes developmental progress: elementary students are "Becoming a Scientist", middle school students are "Problem-Solvers", and high school students become "A Valued Voice in their Community."

SMILE's teacher professional development and curriculum resources increase teachers' ability to engage underrepresented students in contextual learning linked to STEM programs and careers. The Oregon science content and science process standards, as well as "A Framework for K-12 Science," stress the need for students to learn the process of doing science. SMILE

supports this goal through content sessions at each workshop, introducing activities and STEM researchers, and supporting an afterschool learning environment specifically designed to focus on the contextual and process nature of learning science. Further, SMILE activities are aligned with the Next Generation Science Standards, and available on SMILE's Teacher Resource blog.

C) Project Plan

This project supports out-of-school time, STEAM programming for 200 students and teacher professional development for 15 teachers from mostly rural communities. In order to close the achievement gap, SMILE reaches underrepresented students in elementary schools as part of a pipeline program where students' STEAM interests are supported. Teachers recruit students and build an engaging learning community called a "SMILE Club". These clubs meet weekly throughout the school year for about an hour. In the meetings, students are welcomed, have a snack or even a meal, and engage in a hands-on science and math activity. SMILE clubs result from partnerships between the SMILE Program and school districts. The clubs function as a continuous pipeline to college from grades 4 through 12: elementary (grades 4-5), middle (grades 6-8), and high (grades 9-12). The program elements and outcomes are further defined in Appendix C and the SMILE Program's Theory of Change.

With higher education partners at Eastern and Southern Oregon Universities and Portland Community College-Rock Creek, SMILE holds regional College Connection events called Elementary Challenge Day. Clubs members experience a day at a college, link their interests and aspirations to specific college programs and careers, and meet others who share their enthusiasm for STEAM learning. The event is designed such that college faculty (presenters) and students (mentors) engage students in a team-based challenge involving the application of their STEAM content knowledge gained in classrooms and clubs.

SMILE students apply content learning to world issues, community needs, and STEAM-related careers through contextual learning themes and problem-based learning (NGSS College Readiness). This spring, during the morning session at PCC-Rock Creek, elementary students will learn about the goals for their "Community Garden" and gain additional science content in hands-on sessions. In the afternoon each team will pick a purpose, define their design goals for their garden, and develop a plan to share others students. Students need to acquire specific academic and contextual knowledge to succeed in college. Their college readiness is an alignment among student skills, interests, and their postsecondary objectives (Redefining College Readiness, David Conley, 2007). Therefore SMILE's programming involves academic and contextual learning as well as forming an academic mindset. This mindset helps students understand how to solve problems, structure their knowledge, and form a strong sense of their academic identity.

Additionally, SMILE's Family Math & Science Nights (FMSN), held in the fall in each community, brings together SMILE students, their families, club advisors and community members. Students demonstrate hands-on activities, and college readiness information is displayed and distributed. The goal for the FMSN is to involve the community in fostering a college going culture that engages youth and their families in supporting college access.

In support of elementary teachers, SMILE Teacher Workshops increase their content knowledge and provide curriculum and materials to use in clubs and classrooms. SMILE clubs support teacher professional development by functioning as "test beds" for club advisors to present and adapt curriculum before using in a classroom. Curriculum and activities should increase students' interest, persistence and engagement in STEAM-related subjects. SMILE's

professional development integrates practices, crosscutting concepts, and disciplinary core ideas by using the natural interconnectedness of STEAM disciplines to engage teachers and students.

D) Evaluation Plan

The outcome for this project is reaching high need students with programs that will support their interests, aspirations in STEAM learning, where they will gain those attributes shown to support their persistence and attainment in school, and access to higher education. We demonstrate reach through our student database: numbers and demographics of students, persistence and longevity of students measured by club years, high school graduation rate, and college enrollment rate. We will collect information on impact from club applications; evaluations from students, chaperones and teachers at College Connections events; teacher workshop evaluations; and end-of-year evaluations from teachers, students and parents.

We collect data on student's interests at the beginning of the year in the club application and at the end of the year through the end-of year evaluations. Additionally we ask teachers and parents to note the impact the program has had on interest and academics. The teachers complete monthly logs on clubs to document the meeting, numbers of students who participate, and activities during the meeting. We will implement a specific pre and post-survey for the year for the students that will directly address their knowledge about college, programs and careers linked to their interests, as well as the attributes needed to be successful in college.

E) Sustainability

SMILE's programming is based on long-term partnerships built over a 27-year history. Funding is collaborative: SMILE and school districts execute annual contracts, and grant partners support club activities and teacher professional development. Communication to/from superintendents, teachers, and other stakeholders enhances the partnerships and resolves issues.

F. Budget Justification: SMILE is requesting \$108,019 for the length of the project period.