

## **CaMSP Partnership Profile – Coachella Valley USD Science and Engineering Partnership-Project Prototype**

### **Core Partners**

Coachella Valley Unified School District, Palm Springs Unified School District, Desert Sands Unified School District, California State University San Bernardino, University of California Riverside, Bourne's College of Engineering, College of the Desert, K-12 Alliance (WestEd)

### **Regional Partners**

Coachella Valley Economic Partnership (CVEP), S.M.A.R.T. Education, College of the Desert's Desert Energy Enterprise Center, California State University, San Bernardino Palm Desert Campus, Palm Springs Unified School District Linked Learning, Desert Sands Unified School District Linked Learning, Coachella Valley Unified School District Linked Learning

### **Contact Information**

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### **Target Population**

Fifty 6<sup>th</sup> -12<sup>th</sup> grade teachers

### **Core and Supporting Disciplines**

Science is the core discipline and engineering is the supporting discipline.

### **Teacher Quality**

Fifty 6<sup>th</sup>-12<sup>th</sup> grade teachers participate in Project Prototype's three-year professional development program. The rationale of our teacher selection process focused on empowering existing Career Pathways programs throughout our districts. As a result, chosen teachers were secondary science and Career Technical Education (CTE) teachers, because CTE teachers were identified as those most important to building strong STEM-related career pathways in the Coachella Valley. Individual teachers were then also given priority according to three factors: whether or not they were part of an organized team from the same school site and grade level, worked at a high needs school, and were a member of a partnership academy or career pathway.

Each year of Project Prototype's three-year professional development program has a focus for the progression of intensive to follow-up. The first year's intensive builds teacher pedagogical content knowledge about NGSS and engineering careers. The intensive begins in the spring, with an awareness day focused on NGSS and project-based learning. Teachers will have an additional follow-up day at their site to analyze their current curriculum practices and pathway projects to identify their successes and their weaknesses. Perceived curricular weaknesses will then be used by the summer intensive teaching cadre to plan the summer content intensive. The summer intensive will include the content cadre modeling the teaching of a short engineering project, with reflection on the instructional practices and outcomes. In addition, the summer intensive builds awareness of STEM careers in medical and energy sectors through local engineer visits and field trips arranged with help of CVEP. Application of the year 1 intensive

begins with preliminary planning of the short module (1-3 weeks) by content-similar teacher teams. Student work will be analyzed using preliminary rubrics, which score individual components of each project.

The second year's summer intensive will focus its science and engineering content on the modules selected by teacher teams for development and refinement. This intensive week will include an additional day that will be used for focused fieldwork in the selected engineering fields to support module development. School year intensive and follow-up hours will focus on field testing modules, and providing final editing through lesson study and student work. During this second year, both the intensive and the follow-up sessions will focus on developing assessments using component rubrics to score student projects. These component rubrics are used to score individual areas of science content, engineering practices, communication (CaCCSS ELA), and math. Assessment will be integral to the final module, and will offer the potential for rigor in maximizing the usefulness of projects' individual components.

The third year's summer intensive moves to refining final modules, providing sessions on developing leadership skills to support dissemination, and designing dissemination activities and venues. Our partner IHE will critically review our integrated modules at this time, in order to finalize and confirm their completion. During year 3, each participant is expected to select two venues for dissemination. Participants will be supported by co-presenting, or working with a team on a collaboratively designed session.

### **Challenging Courses and Curricula**

Project Prototype chose science as its core discipline, and engineering as its supporting discipline. Integrating engineering into our science education in this way will allow Project Prototype to adhere to the emerging Next Generation Science Standards (NGSS), which state that engineering practices must become part of every students' science learning experience.

The professional learning program consists of two levels: The Teacher Participation Program, and The Facilitator and Cadre Leadership Program. The Teacher Participation Program includes summer intensive integrations of engineering and science project-based learning experiences. Seminars with engineers and field visits to engineer's work places are part of these intensive sessions. While mathematics and technology are not the focus of the project, integrations will include both when appropriate. The Facilitator and Cadre Leadership Program will consist of the two chosen facilitators from the district teachers in the LEAs and the teams of IHE professors and teachers, who will lead the content portion of the summer institute. The leadership program will devote 32 hours of development time to design the summer institute.

The products that will result from Project Prototype will be integrated engineering replacement modules for middle school and high school science classes. Specifically, a short-term module (1 to 2 weeks) and a long-term unit (3 to 6 weeks) will be designed for each grade level and subject involved in the project. Modules will then be taught, refined, and re-taught, and data will be collected before modules are disseminated. Student communication within the project-based modules will be integrated to Common Core in ELA writing standards, as recommended in NGSS.

### **Institutional Change and Sustainability**

As the only four-year State University in the region, CSU San Bernardino will serve as Project Prototype's lead IHE. CSUSB has an established history of working with participating local LEA's, and the biology department at CSUSB will provide all life science professional development content. Bourns College of Engineering at the University of California Riverside has also been chosen as a partner LEA, because of its role as the capstone of local STEM career pathways. Bourns College of Engineering has strong programs in Project Prototype's subject areas of Bioengineering and Alternative Energy Sources Engineering, and will provide professional development content related to these fields.

### **Products and Dissemination**

Project Prototype will use regional networks to share our innovative professional development with local science and math educators. These regional networks include the Riverside County Office of Education (RCOE) District Science Leadership Network, the Southern California Association of Science Supervisors, and the RCOE Career Technical Education meetings. Professional development will also be communicated through statewide meetings like the California Science Teachers Association, the California Partnership Academies Conference, and WestEd STEM units—including the K-12 Alliance and MESA's statewide networks.

In Project Prototype's third year, participating teachers must commit to 14 hours of follow-up dissemination activities. As a result, teachers will comprise the final part of Project Prototype's dissemination plan. These teachers will develop training modules—ranging from a 20-minute online overview to a full-day presentation—for the full range of tested and verified STEM curricula. In addition, a regional mini-STEM conference will be held at the CSUSB Palm Desert Campus, inviting science and CTE teachers from the region to learn how the developed modules and STEM project-based learning techniques align with the NGSS.