

**Early-Phase Competition Absolute Priority 3 (STEM)
Santa Clara County Office of Education
S411C230204**

Data Adventures: A Mobile Makerspace to Promote Data Literacy, Digital Storytelling, and Interest in Data Science

Applicant Name: Santa Clara County Office of Education

Project Title: Data Adventures

Type of Grant Requested: (select one) Early-Phase Mid-Phase Expansion

Absolute Priorities the Project Addresses: (select all that apply)

Absolute Priority 1-- Demonstrate a Rationale (Early), Moderate (Mid), Strong (Expansion)

Absolute Priority 2-- Field-Initiated Innovations—General

Absolute Priority 3-- Promoting STEM Education

Absolute Priority 4-- Meeting Student Social, Emotional, and Academic Needs

Absolute Priority 5-- Educator Recruitment and Retention

Competitive Preference Priorities the Project Addresses: (select all that apply)

Competitive Preference Priority 1— Promoting Equity in Student Access to Educational Resources and Opportunities: Implementers and Partners

Competitive Preference Priority 2—Supporting a Diverse Educator Workforce and Professional Growth to Strengthen Student Learning* (FOR EARLY-PHASE AP5 APPLICANTS ONLY)

Total number of students to be served by the project: 3,750

Grade level(s) to be served by the project: 6 - 7 grade

Definition of high-need students: English Language Learners (ELL), students with disabilities (SWD), students from limited income communities, and students in rural communities.

Brief description of project activities: Our proposal, Data Adventures, addresses each of these issues - inequities in access to data science instruction, inequities in access to emerging technologies and tools, a lack of diversity in STEM fields, and a lack of relevant learning experiences for high need students - by integrating innovating, accessible, and culturally relevant and sustaining data science content into STEAM offerings centered on authentic, immersive experiences using technology and tools delivered by a mobile data makerspace and supplemented with cross-age tutoring to increase student excitement for STEAM and incorporate student identity, voice, and choice through digital storytelling.

Summary of project objectives and expected outcomes:

Objective 1: Improve access to, achievement in, and interest in STEAM among high-need students..

Outcome 1: Increased representation of target populations in STEM fields

Objective 2: Develop and collaboratively co-design and refine interdisciplinary content from data science, data literacy, and STEAM to increase rigor and relevance in preparation for implementation..

Outcome 2: 4-6 Data Adventures designed, refined, and tested.

Objective 3: Create teacher onboarding materials to support implementation and increase teacher self-efficacy, knowledge, and practice in data science. Outcome 3: Increased teacher data science self-efficacy

Objective 4: Conduct experimental evaluation of Data Adventures' effects on student knowledge, self-efficacy, and practice in data science and data literacy. Outcome 4: Teachers have background knowledge, practice, and technology skills to implement Data Adventures

Objective 5: Support dissemination and scaling of Data Adventures for use in other high-need communities. Outcome 5: Resources exist to support schools interested in adoption or experimentation

Summary of how the project is innovative: The proposed initiative is pioneering in its approach, as it furthers and refines existing research on the effects of instructional design, makerspaces, and cross-age tutoring. It aims to offer middle school students real-world contexts in which they can exercise quantitative reasoning and engage in data manipulation tasks. These tasks include formulating

conclusions, making arguments based on evidence, and defending their conclusions. The successful execution of this proposal will broaden the evidence base for such interventions and promising strategies, providing a foundation and resources for this model to benefit more students across the country.

Other studies related to the proposed project: Research on the effects of students and data: Hamilton, L., Halverson, R., Jackson, S., Mandinach, E., Supovitz, J., & Wayman, J. (2009). Research on cross age tutoring: Bayer, A., Grossman, J., & DuBois, D. (2015). Research on student science achievement: U.S. Department of Education. (2012).

Proposed implementation sites: 20 high need schools serving 6th and 7th grade students in Santa Clara County and in rural communities.

Organizations partnering with this project: WestED, San Jose State University, Policy and Research