Science in the Learning Gardens: Factors that Support Racial and Ethnic Minority Students' Success in Low-Income Middle Schools

National Science Foundation Award: $499,998

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Science in the Learning Gardens (SciLG) will use school gardens as the context for learning at two low-income middle schools with predominantly racial and ethnic minority students in Portland, Oregon. There are hundreds of gardens across the country that are underutilized as contexts for active engagement in the middle grades. School gardens provide important cultural contexts while addressing environmental and food issues. SciLG will bring underrepresented youth into gardens at a critical time in their intellectual development to broaden the factors that support motivation to pursue STEM careers and educational pathways. The project will adapt, organize, and align two disparate sets of existing resources into the project curriculum: 6th grade science curriculum resources, and garden-based lessons and units. The curriculum will be directly aligned with the Next Generation Science Standards (NGSS).

The three-year project will use a design-based research approach to refine instruction and formative assessment, and to investigate factors for student success in science proficiency and their motivational engagement in relation to the garden curriculum. Co-designed by middle school science teachers and university faculty, SciLG curriculum will highlight the integrative nature of NGSS. The curriculum will be pilot-tested during the first year of the project in four sixth-grade classes with 240 students in Portland Public Schools. Students will be followed longitudinally in grades 7 and 8 in years 2 and 3 respectively, as curricular integration continues. The research team will support participating teachers each year in using their schools' gardens, and study how this context can serve as an effective pedagogical strategy for NGSS-aligned science curriculum. Academic learning will be measured by assessments of student progress towards the end of middle-school goals defined by NGSS. Motivation will be measured by a validated motivational engagement instrument. SciLG results along with the motivational engagement instrument will be disseminated widely through a variety of professional networks to stimulate implementation nationwide.