ABSTRACT

The Pack: Using Game-based Learning to Infuse Computational Thinking into Science Teaching and Learning

Type of Grant Requested: Early-phase

Absolute Priorities: 1-Demonstrate a rationale; 2-Promoting science, technology, engineering, or math education, with a particular focus on computer science

Competitive Preference Priority (optional): Computational thinking

Number of students to be served: 27,000

Grade levels to be served: 6-8

Definition of high-need students: Eligible for free or reduced-cost lunch and are from groups traditionally underrepresented in STEM careers.

Project Description: The majority of middle school students are rarely developmentally and cognitively prepared to reason computationally about complex science concepts. This project proposes will address this problem in high-need school districts in New York City (NYC) through the implementation of *The Pack* intervention, which is comprised of an open world game, supplemental curriculum resources, professional development, and online communities of practices (CoPs) for teachers. This program is uniquely designed to engage middle-school students in standards-aligned CT activities and support teachers in infusing CT into science instruction to significantly increase students' CT engagement and skills. The project' will test *The Pack* intervention in 54 schools.

Objectives and expected outcomes:
- Develop supplemental instructional resources that leverage *The Pack* game in support of teaching CT skills in middle grades science instruction
- Develop professional development activities to support 226 teachers' implementation of *The Pack* intervention in their science instruction
- Develop an online CoPs to provide ongoing implementation support to teachers
- Test the intervention's effectiveness when implemented with fidelity to increase students' CT engagement and skills

List of sites: NYC Districts 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 32 in Brooklyn, and District 24 in Queens.

List of partners: New York Hall of Science; Participate; American Institutes for Research; and above districts.