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 to 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 practice (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.