

New ‘Performance Tasks’ (With Stink Bugs!) Make Math Relevant and Engaging

If you’ve ever taught math, you’ve probably heard the common refrain: “But when am I ever going to use this in my life?” Thanks to a new set of tools from the Pacific Education Institute (PEI), that question may become a thing of the past. Central Washington FieldSTEM Coordinator Megan Rivard and FieldSTEM Facilitator Samantha Fulton recently collaborated on developing a set of math ‘performance tasks’ for various grade levels that are both engaging for students and deeply relevant.

Performance tasks are mini-research units that align STEM and English Language Arts (ELA) or math with Next Generation Science Standards. Until now, PEI staff had created multiple performance tasks connecting STEM and ELA, but none focused on math. “It’s something we’ve wanted to do for a long time,” says Fulton. “We just needed the people and capacity to get it done.”

They broke up the tasks into four groups focused on grades K-2, 3-5 teachers, beginning algebra and geometry, respectively. The first step was deciding what type of performance task would best serve the needs of the population they wanted to reach. For the youngest students, they decided to go with a subject dear to many second-grade hearts: stink bugs.

The K-2 task asks students to examine photos of stink bugs in their habitat, figure out how many stink bugs are in the picture and report back on their findings, explaining how they came up with that number. As support, they’re provided with a set of vocabulary and sentence frames they can use to describe the process.

For older students in beginning algebra, the performance task focuses on Bull Kelp beds, a familiar sight to anyone who lives along the Washington State coastline. Students are asked to look at a map of a bull kelp bed in a specific region and use formulas, graphs and other mathematical tools to determine what the bed’s area will be at several points in the future. Again, they are offered language frames to explain their reasoning. After the question has been resolved, students conduct a self-assessment of the statements ‘I can apply algebra concepts

to solve a problem about monitoring Bull Kelp beds' and 'I can build a function that models a relationship between two quantities.'

One key consideration in formulating the tasks was how to connect them with PEI 'career profile cards', a collection featuring detailed information about specific people in different jobs within the natural resources and conservation fields who apply math and science as part of their role. "We wanted to create resources that were as locally relevant and connected to careers as possible," says Fulton. "I reached out to several of the professionals we've profiled and asked them what kind of math they use daily. That gave me some ideas of where to start."

Some of the people profiled are also available to visit classrooms and talk with students. "These are real careers in Washington State," Rivard points out. "There are opportunities to find these people in your community, have a conversation and have the kids learn from them."

Once the performance tasks were in draft form, complete with necessary resources and materials aligned to Next Generation Science Standards and Washington state math standards, Fulton and Rivard brought them to 33 teachers who attended a Math Performance Task workshop in April. Of those, 13 implemented one of the performance tasks with their students in the spring. All 13 were elementary school teachers.

Among the teachers who implemented tasks, some came up with ideas about connecting them to weather and outdoor spaces around their school. "They were able to add more and integrate their math and science, which is always very exciting," says Rivard. "Someone else did a whole unit on insects so the stink bug performance task fit seamlessly."

Others took their students outside and did local species counts. The class had already been working on decimals and fractions and they began adding bars and graph charts around some of the species in their performance task.

“They got to compare and contrast something that was not in their region with something that was,” Rivard notes. “It was cool to see the ways the math performance tasks were integrated into content and how people were able to take that into outdoor spaces.”

One second-grade teacher connected the performance task with a science unit on habitats, explaining how the invasive stink bug could damage the school garden’s habitat and why students needed to collect data on how many stink bugs had been found in other habitats. The result: “The students were very invested in the activity and even made a plan to hire an exterminator by the end of the lesson!”

With the first four performance tasks ready for publication, Fulton and Rivard are looking ahead. Ideally, they will write more tasks over the summer and conduct another workshop for teachers in the fall to facilitate further classroom implementation.

“There is so much opportunity here,” says Fulton. “The next logical step is to build this out and create a good catalog of these. They were so positively received by teachers, that this has to be a high priority.”