

IU13 Students Participate in Governor's Regional STEM Competition

Students from Andrea Fellows' classroom at our Fairland School had the opportunity to participate in the Governor's Regional STEM Competition this year. This is the first time one of our ECSES classrooms has participated, and we couldn't be prouder! Our students created the Showerability Helper – a harness for those with limited mobility to use while showering,

enabling them to shower more independently. During the project, the students had to do research, consult with companies about the types of materials to use for the project, design a prototype, do some initial testing, develop the final product, and prepare for the actual competition. They did a phenomenal job! And, while they didn't advance to the next level of the fair, they learned a lot and caught the attention of many.



As part of the project, the students worked with Lori Blantz, who takes STEM curriculum and adapts it for students.

[Read the full story about this heartwarming project and the important life lessons learned by the students](#)

Many times, people discover far more than mere solutions to a problem when working as a team to complete a project. Andrea Fellows' class at IU13's Fairland School in Manheim learned just as much about themselves and life while working on their entry for the regional qualifying event of the Governor's STEM Competition, held at IU13 on February 2020. Through newfound patience, creativity, and skills, they worked together to craft a device that helps anyone with limited mobility to do one essential, everyday task: showering.

Researching Options

The project started with a problem. According to the PA Department of Education website, "The Governor's STEM Competition challenges student teams from across the state to research, design, and present a device or project that can make the quality of life better for Pennsylvanians by accomplishing a series of practical tasks that can fulfill real-world needs." One of their classroom paraeducators, Ms. Katie, has a daughter with disabilities who finds it difficult to shower on her own. Because the



problem is so universal for people with special needs, the class rallied around the idea.

They did lots of research before going to the drawing board. What barriers does Ms. Katie's daughter face? What steps must she take while taking a shower? What is her weight? What is the size of her shower? How limited is her mobility?

The solutions devised were myriad, but with patience, the class narrowed it down to two options, which they constructed into cardboard prototypes. The first is a chair with a circular showerhead holder above and below, which helps for full-body cleaning. There is a hinged support for entering the chair and, because containers are difficult to pick up if dropped, attached containers keep the soap handy.

The second option involves a free-standing apparatus that fits into the shower without the need to modify the building's structure. It has a harness in the center, attached to a chain, which allows the user to move more freely under the shower water. After some debate, the class chose this waterproof design because of its simplicity and adaptability.

Activity and Precision

The concept is simple and the apparatus is lightweight; consequentially, the team needed to calculate precise angles and weight ratios to ensure that it would not only hold a stationary user, but hold up to everyday wear as well. The team researched materials—even going so far as to reach out to the company that makes some of them for data—and settled on PVC pipe for the supports. Versus metal, PVC is readily available, inexpensive, waterproof, and lightweight—yet strong enough to hold the user. It can also be held together with glue and connectors without the need for welding knowledge. One of the students, Nadeem, became the team's chief measurer, calculating some of the measurements using the Pythagorean theorem to ensure a precise fit. They need to stick to a budget of \$500 so the next step, belonging to another student named Alex, was to price out as many materials as he could before heading to Lowe's.

The team obtained assistance Lowe's with an employee named Jerry. According to Ms. Fellows, Jerry was "absolutely perfect (the kids kept referring to him later as the Bill Nye of Lowes). He took the time to see our project/idea, give ideas on how to make it simpler and explained to the students that PVC is made for plumbing, so the pieces are shaped and made to have water flow through (therefore some shapes that we had in our diagram were unavailable)." After helping them with redesigning he showed them how to build their model right there in the aisle.



“I really feel that both the staff and students have a good idea of how to move forward with the project now,” said Ms. Fellows. “Jerry also showed us how to use the glue...and helped us with a solution for the ‘feet’ of the model. They will be non-slip, with the addition of a rubber sheet that he showed to the students, and the ‘plug’ screws into the PVC connector, so it will be able to shorten or lengthen somewhat to account for uneven bottoms of tubs.”

Next Steps

Next, the students had to transition from the planning phase to the construction and implementation phases. After the prototype build, the class tested the system, recorded their results, and used them to write a five-paragraph essay for submission. As part of the Governor’s Regional STEM Competition, the students participate in mock interviews and design both print and PowerPoint presentations for use at the competition.

The entire project was filled with wins and life lessons. Students Ricky and Malcolm discovered a happiness in working with friends and finding the patience to see the project through. Nadeem found a hidden talent for measuring and piecing things together. Student LaShay loved the activity and creativity involved. Above all, they discovered that they can help change the world with practicality, adaptability, and persistence. That’s a win!