



## EDUCATOR PROJECTS AND IDEAS

### Using a Real Problem to Teach Math

In Ms. Baker's Algebra 3 class at eSTEM last month, students learned about quadratic equations. However, instead of simply drilling through a plethora of problem sets, students addressed the problem, "How can we boost the Wi-Fi hotspot on Ms. Baker's phone?" Ms. Baker has shared her own passion for gaming with her students, including her accounts of playing the recently popular game *Pokémon Go* with her own children. If her kids were sharing the Wi-Fi on her phone between their own hand-held devices, how could they enhance their experience of playing the game together?

"I wondered if my students had a hotspot they wanted to boost on their own phones, regardless of whether they played *Pokémon Go* or not. It turns out, students were really interested- even if they didn't have a phone with a hotspot, they were interested in learning about it," said Baker.

During the *Hotspot Unit*, students worked to brainstorm, design, and build a device that would enhance the hotspot projection on Ms. Baker's phone. Students also worked through traditional

algebraic problem-sets during Warm-Ups and on homework to acquire the skills and conceptual understanding that they would need to work on the problem.

"It's nice to see that this math actually *does* something," said one student.

Students used DESMOS (see banner photo, above), a free web-based app to find the equations of the parabolic shapes in their device designs. While using DESMOS to construct the first draft of their design, some students used a search engine to recall the



Source: PAST Foundation

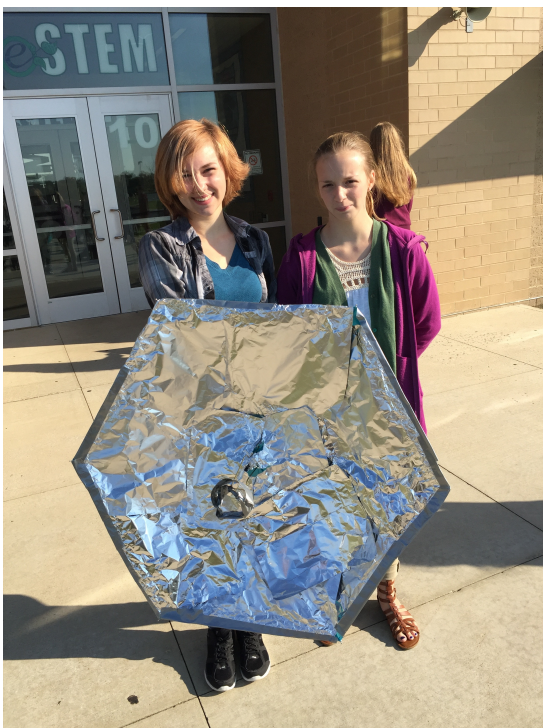


definitions and mathematics of *directrix* and *vertex* forms from their earlier problem sets. Then, they combined their research and algebraic understanding to draft their designs.

During the evaluation and modification phase, students tested their devices outside with Ms. Baker's phone, and then analyzed the ways they could improve them, information that would be a major component in their final report. On the last day of the project, students tested their devices a final time, and the winners for greatest hotspot-booster distance were determined.

"Honestly, I didn't think the devices would work—well, maybe a few of them," admitted Baker. "But every single device boosted the wifi on my phone! It was awesome, and the kids thought so too."

Supporting Ms. Baker in her organization and facilitation of the Wifi Unit is one demonstration of how the School Design Team at PAST helps support teachers (both locally and at a national level) in



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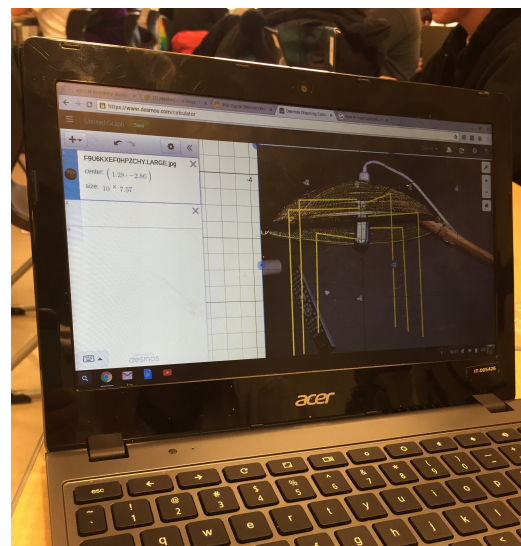


Source: PAST Foundation

bringing real-world applicable, hands-on learning to their classrooms.

"The PAST team was good for bouncing ideas off of, helping me with incremental planning such as putting together a rubric... and boosting my morale for when things didn't go quite the way I imagined they would," laughed Baker.

Heather Kellert, a member of the School Design Team and math educator herself, reflected on her work with Baker. "It was enthralling to watch Jacinda brainstorm such an engaging application of the otherwise, very abstract mathematics she was teaching. From brainstorming with her, to reflecting on the unit as a whole-- it was a fascinating process to get to be a part of."



Source: PAST Foundation