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## Kalamazoo middle-schoolers study engineering careers at WMU

Most of the initial bridges designed by Kalamazoo Christian Middle School students collapsed on the computer screen when a simulated vehicle used them.



Examining the “fizzing” quality of a mixture and why the balloon is not inflating are (L-R) **Amanda Rossman**, a WMU second-year civil engineering student from Flint; KCMS student **Rebecca Dykstra**, **Dr. Andrew Kline**, a WMU chemical engineering professor, and KCMS student **Haley Hixon**.

Student reactions to the bridge failures varied from **Lori Dykstra**’s barely audible, “Oh, no,” to hysterical laughter by three of her classmates – **Brendan Pomeroy**, **Reid Petro**, and **Luke Sly**. “That’s awesome,” Petro said.

The young bridge designers were part of about 30 KCMS students who spent their school’s Career Exploration Week at the Western Michigan University’s College of Engineering and Applied Sciences’ Parkview Campus.

Associate professors **Dr. Andrew Kline**, from the paper engineering, chemical engineering and imaging (PCI) department, and **Dr. Sherif Yehia**, from the civil and construction engineering (CCE) department, supervised activities that included chemical experiments and the simulated bridge-building project. “These activities are related to what they would be doing if they studied chemical or civil engineering,” Kline said.

Checking out chemical reactions are KCMS students **Caleb Postma** and **Kyle Prentice**



According to Kline, the middle schoolers who selected engineering came to the Parkview Campus every morning for a week. “We had an introduction on the first day, and then two days of engineering problem solving and playing with the data, one day of preparing a PowerPoint presentation on what they learned about the data, and a final day making a presentation assessing what they actually learned,” he said.



Watching their bridge design collapse in a simulation are KCMS students (seated L-R) **Brendan Pomeroy**, **Reid Petro**, and **Luke Sly** and WMU students (standing L-R) **Josh Host**, **Ammar Zait**, and **Joe Barbera**.

Kline led a number of experiments for students to observe the effects of mixing common household products like baking soda, vinegar, lemon juice, and Alka Seltzer.

Yehia taught basic bridge design principles and had the students use computer simulation software to test various bridge designs in terms of stability and cost. “They had to evaluate several scenarios to come up with a safe bridge design at a reasonable cost,” he said. “They played with the different designs and made changes and adjustments after each test until they achieved a successful result.”

The students also explored cement components and studied the simulated results of mixing various combinations and the effects of those mixtures on bridge strength and cost. “This program is designed to give the students a complete hands-on experience in bridge design,” Yehia said.

**Dave Koning**, a KCMS science teacher, explained that every year KCMS students spend a week exploring careers. “It’s a concentrated week of exploring something different, and the students can select from about eight areas of study,” he said.

“Some students stayed at our school doing work in economics, music, computer web building, and other things, but we’ve been coming up here [to WMU] for the last three years to explore engineering,” Koning said.

Only three young women selected engineering, but that was all right with Dykstra, who partnered for the bridge design with KCMS science teacher **Jessica Setsma**.

...Courtesy of the *Kalamazoo Gazette*

Send your thoughts on this article or your suggestions for future articles to the editor at [jerrie.fiala@wmich.edu](mailto:jerrie.fiala@wmich.edu) Thank you.