

## Tomorrow's engineers

Students build model bridges, submit them to harsh stress test

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March 31, 2009

Tom Miller put the screws, or more specifically, the Tinius-Nelson Universal Testing Machine screws, to 10 lightweight bridges built by 17 Gifted and Talented Education students from Martha P. King Elementary School, as part of the 20th annual Student Model Bridge Building Contest held at UNLV.

As expected, they all failed the load plate pressure test -- some more quickly than others.

Of the 10 basswood bridges that all passed the 30-gram (1.06-ounce) weight test during the Feb. 28 competition, the wood-and-glue structure built by Amy Pellouchoud and Katlyn Jackson survived among the longest under a pressure of 37.5 pounds.

"Right now, that's in 11th place overall," said Miller, a member of the American Society of Civil Engineers, one of two principal sponsors of the Clark County School District-wide competition. "That's a really good job."

The next-closest bridge, built by Zachary Shattler and Marc Wolpert, came in at 21 pounds followed by seven bridges in the 10- to 19-pound range. One bridge came in at six pounds.

"I think it was a lot of hard work for a good reason," said 11-year-old Katlyn, who wants to be either a zookeeper or veterinarian when she enters the work force. "Lots of triangles helped, too."

Katlyn's bridge-building partner, Amy Pellouchoud, wasn't there to see their creation take the top spot among the school's entries as they underwent testing in a cool, dark lab tucked away in the Thomas Beam Engineering Complex.

According to GATE instructor Anne Marie Eby, Katlyn and Amy were determined to make the competition even though the bridge they started out making didn't quite meet specifications.



photos by FRED COUZENS/view  
Martha P. King Elementary School students watch as model bridges are subjected to strength tests during the 20th annual Model Bridge Building Contest, held at the Thomas Beam Engineering Complex on the UNLV campus, Feb. 28.



Engineer David Nord places a bridge built by a Martha P. King Elementary School student into a press prior to subjecting it to a strength test during the 20th annual Model Bridge Building Contest, Feb. 28.

"Katlyn and Amy built two bridges because the first one was too high," Eby said. "They built and completed their second bridge before some of the students had finished their first bridge. I was really impressed by their creativity and ability."

Bryan Jones, who teamed up with Sam Woodbury to come in at 10.25 pounds, described their design process.

"From the pictures we saw, we thought a rounded top and the arch would help it stay together more," he said as he waited in the engineering building lobby before their entry was put to the test. "We both glued, too."

Niguel Nusser, who partnered with Emily Cooper to build an 11.5-pound entry, talked about their "secret material."

"Triangles are stronger and using the green glue, that's the secret," she said.

The GATE students began building their creations in mid-January and had them complete, for the most part, days ahead of the Feb. 28 event, but Eby said one was still being worked on until the day before.

Last year, Aaron Richner, Tyler Goodale and Brent Hickey entered King's strongest bridge, which held together until it reached the 40.5-pound mark.

The bridge-building contest put on by ASCE and the Bureau of Reclamation started in 1990 and has grown to where this year 32 elementary schools, 11 middle schools -- Garrett Junior High School was in the competition also -- and 10 high schools competed. King finished 19th out of 35 elementary schools in the contest. The school's highest-ranking team, placing 66th among 252 entries, consisted of Noah Keeling, Meaghan Vanderploeg and Emilia Cubelos.

"We'll probably have close to 300 bridges that will be tested that will be the work of anywhere from 500 to 600 students, especially since they tend to team up in the elementary division," said Paul Matuska, a Bureau of Reclamation employee who was this year's event coordinator. "I think the contest actually involves anywhere from 1,500 to 2,000 students. We typically sell about 700 kits to schools, so if you figure if there are two students per bridge, that's at least 1,400 right there."

Matuska estimated that, on average, about 60 percent of the high schools, 30 percent of the middle schools and anywhere from 22 to 25 percent of the elementary schools participate in the competition annually.

The operator of the Tinius-Nelson Universal Testing Machine makes it a practice to ease up on the pressure exerted on students' bridges at the first sign of buckling, instead of reducing the bridges to a pile of splinters. When the day was done, a couple of the King students had some interesting plans for their cracked, but still mostly intact, bridges.

Katlyn said of her and Amy's winning entry that "me and my partner decided that we were going to cut it in half and keep it forever."

Jackson Dunagan, who teamed up with Evan Klouse, said he planned to subject their bridge to a different kind of stress test once he got home.

"It was fun to see how much it could hold," Dunagan said afterward, "Now, I'm going to take it home and stand on it."