

ANN GOES TO MATH-ON-A-STICK

Minnesota State Fair—August 24, 2019

From the Editor

At the ANN Annual Board Meeting this summer, members of the ANN Board of Directors spent a day at the Minnesota State Fair. Each member spent part of the day volunteering at a very welcoming, open area of the fair grounds called [Math On-A-Stick](#). The set up included a number of stations with manipulatives so folks of all ages could take a break from all the walking around the fair grounds, have a seat, and explore math concepts that are fun and non-intimidating. All stations had an activity that was designed to evoke curiosity and creativity about designs and patterns. They were self-directed so folks could take the activity on their own individual pathway by creating a personal design, pattern, or math moment. Some activities were quiet and reflective, while other activities got you up on your feet building larger than life patterns, jumping around, or writing on the sidewalk with chalk.



The all-day ABE Math-on-a-Stick volunteer day was organized by [#IAmABE](#), which is a local Minnesota based group of teachers that focuses on teacher and student advocacy. Kris Klas, one of the organizers, wrote about her Practitioner Research project, [Integrating Students' First Language into Math Instruction in ESL Classes](#), in the 2019 Spring Issue of *The Math Practitioner*.

Here are a few memorable moments from Math-on-a-Stick that the ANN Board would like to share with the greater ANN community.

Spinning Sand



At one station there was a spinning record player with sand on it. Folks could brush sand off of it or add sand as they wanted to. Then, they could use their finger or available tools to draw something in the sand on the spinning wheel. The results could be unexpected patterns or designs like the one pictured to the left. The family that made it decided that it looked like a face!

This story came in from a father who watched as his daughter was trying out the moving sand. One of the volunteers challenged her to try to draw a straight line in the sand as it was spinning and according to her father, "She looooooved trying it and got pretty good at it!"

The Moving Patterns Game

There was a moving patterns game that some of us couldn't resist trying out! In groups of two or three, folks followed the directions on the pattern cards that were available. Pairs would simultaneously follow the instructions to jump, slide, step, and turn 90 or 180 degrees. Patterns and angles came to life in this engaging activity where whole body movement encourages mathematical thinking.

Malke Rosenfeld is the educator who came up with the game. She has done a lot of work connecting body movement with math. She describes her game at [Math on the Move](#).



Game participants pictured are
Mark Trushkowsky and
Amelia Rivera.
Zdenka Guadarrama is facilitating the game.

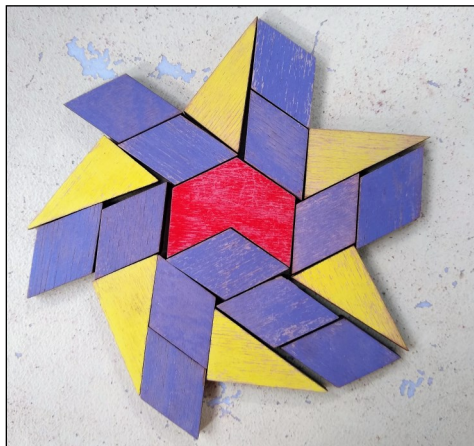
Mark Trushkowsky, pictured on the left, had this to say about why he jumped into the game and then reflected on his takeaways:

"I had been looking at the Moving Patterns station from a safe distance for a few minutes when Chris invited me over to try it with him. I am really glad he did. Just looking, I was able to appreciate how it used dance steps to create rigid transformations, especially slides (translations) and turns (rotations), with your body. But it was very different to do it with my actual body. Especially when I was dancing with another person, because the way I was moving was being reflected by my partner across the line between us and the symmetry was fun to watch (and to create). Translating the clear visual choreography symbols into movement also made for all these other

patterns, especially sounds (a step, a pivot on the pavement, a jump). I found the more I danced with a partner, the more timing became an element and another layer of the physical mathematics we were performing. The station had a book of moves, with each new card getting increasingly complex. It was the first time I ever worked up a sweat doing math—in a good way."

Zdenka Guadarrama, the volunteer pictured above, is a math professor at Rockhurst University who travelled to the State Fair just to visit Math-on-a-Stick! She does a lot of interesting work including a [Mathapalooza](#) Room, where students of all ages can explore and discover mathematics in an interactive environment. Similar to Math-on-a-Stick, the goal is for students to see themselves as a math person, capable of developing their own understanding of mathematics.

Pattern Blocks



This colorful pattern was made by a girl, about 9 years old, whose family was heading down the sidewalk saying, "We're leaving" and "Walking now!" to her. Her brother was picking her up by her waist as she was still finishing her shape. He finally set her down, she finished, and only then ran to catch up with them. This really underscores how our brains are naturally inclined to seek and create patterns, which can lead to lots of higher-level mathematical thinking. What math comes to your mind when you look at this pattern?

I sat at a station and watched as some teenagers created what you see pictured on the right. I thought this might be fertile ground for a [Number Talk](#) so I asked, "I wonder how many elevens there are in that design?" They counted and settled on 17. I pushed: "I wonder if we could figure out the total value of all those elevens by doing mental math?" They thought about it and initially, came up with different totals.

I asked how they were thinking about it. One young girl said, "Well, I multiplied 10×17 in my head and came up with 170. Then I multiplied 1×17 and added that to the 170. The total would be 187." Her friend disagreed, "No. It's easier to multiply 10×11 , which equals 110 and then 7×11 , which equals 77. When you add them up you get 187."

Now they had the same totals but were thinking about it two different ways! It felt pretty great to be sitting at a fair grounds in a relaxed atmosphere and listen to these young folks talk about how they were thinking mathematically about a pattern that they themselves created. I ended my shift feeling pretty good about being there that day.



The ANN Board would like to thank Christopher Danielson and the organizers of Math-On-A-Stick for all the work they did putting the activities together and for reserving volunteer time slots for us so we could participate. Many thanks also to the local Minnesota adult basic education (ABE) and adult numeracy community leaders for getting the word out locally and the Minnesota ABE volunteers who worked alongside the ANN board that day. It was a wonderful experience for all of us. Thank you!