Abstract Math Concepts Spring to Life at UC Square Dancing Club

Samantha Clark
KQED News Blog
May 19, 2014

Daniel Levine and a couple of dozen fellow students are swinging through a classroom at UC Berkeley to a remixed Rihanna song. The lyrics are telling them to “do si do” and “allemande left.”

Finals and graduations are wrapping up this week, but this small group of students has found a way to take a break from all that stress: square dancing.

But no one is wearing petticoats and cowboy boots here. It’s hoodies and sandals.

The appeal to science students and young tech workers is that math concepts take shape in the dance patterns. Square dancing incorporates permutations, fractions and operators, to name a few.

Levine, 23, founded this square dance class last fall after starting his graduate work in UC Berkeley’s chemistry department. When he came here from MIT, where he learned to square dance in his senior year, he saw an opportunity.

“It’s like ‘Oh look! It’s that abstract algebra that I learned, but not abstract because people are dancing now,’ ” Levine said. “For me, (math is) more interesting to see. I’m just a giant nerd, and I keep trying to relate square dancing to what I do.”

Math and puzzle people see square dancing as similar to solving a Rubik’s Cube — challenging and calculative. Eight dancers start and end in the same position, but they don’t know how they’ll find their way home. There’s a near infinite number of ways to get there. They have a split second to recall one of hundreds of dance moves, which a caller dictates.

“It’s always exciting to see what new twist might get thrown your way in the process,” said Greg Ford, a computer engineer at IBM.

That’s what interests Levine, making cool and intricate patterns without having to actually practice a sequence of calls. He convinced his lab partner, David Litt, to join, selling him on the mathematical challenge.

“He said every square has inversion symmetry,” Litt said. “If you look into group theory, which we do in a lot of organic chemistry, there’s some molecules that have inversion symmetry where you invert the points and you’ll get the same shape. I thought that was pretty cool, and I always look for that when I’m dancing.”

Fellow MIT alumna Risha Mars helps the students get the hang of it. She is a software engineer at Twitter who’s often out on the dance floor four nights a week at different square dance clubs.

“Square dancing is all I do,” Mars said. “I like it because it’s like a giant math problem.”

She even studies the dance calls.

“I have little checkers to push around to test myself whether I know what the call is going to be, and sometimes I practice with my friends if it’s a call I don’t understand,” she said.

Mars and Levine met at MIT’s huge square dance club, Tech Squares — only a handful of universities have clubs or classes. After they both moved to the Bay Area, they joined Stanford Quads in Palo Alto. The two are unofficial sister clubs, emphasizing technical rigor. They both focus on the definitions and concepts of the dance calls. Many of the folks in Stanford Quads are programmers, engineers and math teachers.

“I enjoy learning it,” said Jenna Caldwell, a Stanford University biochemistry graduate student. “It’s totally different from what I do all day, but I still get to use my brain. It’s still sort of puzzle-solving.”

Many in the UC Berkeley group say they’re now ready to take on more challenging calls. They’ll do that this summer in the newly formed club, called the Golden Squares.