



An immersion workshop is an important rite of passage for new Math Teachers' Circles. Often, this is a group's first chance to share with local teachers what Math Teachers' Circles are all about. It is also the first big event they will plan as a team.

According to three groups who held immersion workshops in summer 2013, it is well worth the effort. "The immersion experience is what creates community," said Bob Klein of Ohio University, one of the leaders of the Southeast Ohio Math Teachers' Circle in Athens, Ohio.

Gulden Karakok of Northern Colorado University, co-founder of the Northern Colorado Math Teachers' Circle in Greeley, Colorado, agreed. "The thing that's nice about immersion workshops is people really get to know each other, and they get relaxed with each other right away," Karakok said.

"When you go through something that's challenging and experience success together, I think that's what builds community," added Mark Brown of MidAmerica Nazarene University, co-leader of the Heartland Math Teachers' Circle in Olathe, Kansas. "Or maybe it's just the fact that you spend eight hours a day for five days together."

What follows are three different stories about the process of building a community grounded in a love of math and teaching.

SECOND-TRY SUCCESS IN COLORADO

The Northern Colorado Math Teachers' Circle is based in Greeley, Colorado, about fifty miles north of Denver. With a population of about 110,000, Greeley is home to four middle schools, five high schools, and a handful of charter schools.

Greeley is also home to the University of Northern Colorado (UNC), which serves as home base for the Math Teachers' Circle. Cathleen Craviotto, a former UNC faculty member, started the Circle. The Circle's leadership team also includes UNC faculty Gulden Karakok and Katie Morrison and local middle school teachers Bonnie Funk, Delia Haefeli, and Julie Samsel.

After participating in a "How to Run a Math Teachers' Circle" workshop in 2011, the leaders were fired up about starting a Math Teachers' Circle in their hometown and planned to kick off their Circle with a summer workshop in 2012.

Craviotto wrote a couple of grant proposals to raise money for the workshop. Within a few months, they

BEST FOOT FORWARD

IMMERSION WORKSHOPS GIVE NEW MTCs THE BEST START POSSIBLE

by Hana Silverstein

secured nearly \$15,000 from State Farm, as well as seed grants from the American Institute of Mathematics and the Mathematical Sciences Research Institute.

They had the money. They picked the dates and a tentative location. They were excited to start. Now they just needed teachers.

But only one person signed up.

“We weren’t able to get enough attention,” Karakok said. “We started sending flyers out and everything, but we weren’t getting any applications or interest by March or April. So we decided we probably should stop at that point and change our plan.”

The new plan: start small. Instead of kicking off with a summer workshop, they began by holding evening math sessions in fall 2012.

Now, there was a little more time to plan. The UNC Foundation helped the group create a budget. The organizers wanted to have the workshop off campus, far from the teachers’ homes. The dream location was Estes Park, known for its spectacular views of the Rocky Mountains, as well as for being home to the hotel in the movie “The Shining.”

Craviotto and her colleagues estimated \$40,000 for their dream budget. Teachers would stay in hotel-style lodge rooms on a YMCA campground. Since it was a

far-away location, gas money would be included, as well as full room and board. Door prizes, books, and other materials were also included in the budget.

At the same time, the leaders wanted to think about the possibility of not getting that kind of money. Could they still have a workshop? They came up with a back-up plan. They would hold the workshop on the UNC campus, and teachers could stay in dorm rooms. “Having those two plans helped us to see what we could include and what we didn’t need,” Karakok said.

They ended up with a little over \$30,000. “We were lucky that State Farm let us keep the money for the next summer. If we weren’t able to keep that money, we would have forced ourselves to get teachers there, but we were lucky. I think it worked out better.”

They redoubled their efforts on recruitment. “We started going to schools,” Karakok said. “We kept emailing and requesting time to meet with the school district administration. We drove around to the schools and introduced ourselves to the principals. That’s something I would definitely recommend to other MTCs—not just emailing, but face-to-face contact.” They coordinated with the school districts to make sure there were no conflicts the week of the workshop, and booked the dates at Estes Park.



Participants at the Northern Colorado MTC’s immersion workshop in Estes Park pose for a photo together at the conclusion of the workshop.



By the end of March, they had over 30 applications from all over Colorado, and even a couple from other states.

The leaders' priority was to accept teachers from the local school districts. After that, they invited applicants who lived close together, so even if they lived too far to attend academic-year meetings in Greeley or Denver, they could keep communicating with each other after the workshop.

"What do teachers do all summer?" wrote organizer Julie Samsel, afterwards, in *The Greeley Tribune*. "Well, 24 teachers from various parts of Colorado spent four days with me at a math retreat in Estes Park."

The teachers were immersed in problem solving from 8:30 a.m. to 5 p.m. for four days, stopping only for coffee breaks and communal meals.

After dinner each night, there was an optional evening session where teachers could keep working together or hang out and play math games. On other nights, there were social events like a barbecue outside on the campgrounds or an optional hiking trip.

Of course, four days are not enough to do everything. The leaders had some trouble picking problems and finding a focus. "One thing we probably want to modify for next summer is having our evening sessions focus more on how to implement these ideas in classrooms," Karakok said. "We did not have enough time to have teachers reflect back on how to do these things with their students."

Paul Zeitz of the University of San Francisco came to lead a few sessions. "He was one of the leaders at the AIM workshop," Karakok said. "He said he always goes and visits sessions. So, we contacted him and asked if he was available."

Zeitz described the kind of help he gives these new groups: "As little as I can. The trick is to give the least amount of help so that people will do things on their own. And it's because what you are teaching is not math, but a way of thinking about math where you learn to investigate."

Engaging with teachers from different backgrounds was a big learning experience. "We had fifth grade

teachers working alongside high school teachers," Karakok said. "Some had not seen geometry in a long time, or never had an experience with transformational geometry. One of the best comments we got on our post-evaluations was, 'We were actually thinking throughout the whole workshop.'"

"FUNSTRATION" IN KANSAS

The night before the Heartland Math Teachers' Circle workshop began, Mark Brown of MidAmerica Nazarene University was thinking about the fun and frustration the teachers would experience. In a moment of inspiration, he coined a new word: "funstration."

"I didn't think the word would become so prevalent during the week until Paul Zeitz heard it," Brown said. Zeitz, who had also helped at the Northern Colorado workshop, flew in mid-morning on the first day of the Heartland workshop, and after hearing the word, sent it into cyberspace to a group of leaders at AIM.

It was important for Brown and his co-leaders—MidAmerica faculty Gary Andersen and Lisa Erickson and middle school teacher Ashley Nuñez—to bring in outside help when planning the workshop. Based in Olathe, theirs is the first Math Teachers' Circle in Kansas.

They consulted with Zeitz, as well as Diana White of the University of Colorado Denver, one of the leaders of the Rocky Mountain Math Teachers' Circle. Both came and led sessions during the workshop.

A few months before the workshop, Brown went to the Circle on the Road in Puerto Rico, an MSRI-sponsored workshop for leaders of math circles. Being there gave him some great ideas for sessions.

Most of the funding for the workshop came from the Preparing Educators for Rural Kansas (PERK) Grant, funded by the U.S. Department of Education. "Part of the grant was for developing a separate middle-level program for preparing math teachers," Brown explained. "I was able to fit the MTC idea into

what we were already doing. So, we didn't have to go out and do a lot of meeting with people to try to raise money."

With money taken care of, the Heartland leaders considered their priorities. "We got a feel from the teachers, especially those that were parents, that they wanted to be home in the evenings. Originally, we had in mind to bring them to campus, looked at local hotels, but decided that wasn't a priority," Brown said.

"We were able to provide great lunches, one dinner out, snacks throughout the day. We went out for dinner on Tuesday night, and just had a really great time. I could tell the next day, the teachers had another level in their relationship with each other."

Many of the participants in the workshop at MidAmerica Nazarene teach at local private Christian and Catholic schools. "They don't have a lot of the same opportunities for professional development that public school funding has, so they found this to be something that's been really good for them."

Other recruitment efforts included doing three or four presentations at smaller workshops. They also sent out flyers to middle school teachers within 30 miles of Olathe, and used word-of-mouth to make connections at the private schools.

"We charged \$50 for the whole week," Brown said. "Even a small financial commitment lowers the probability of no-shows."

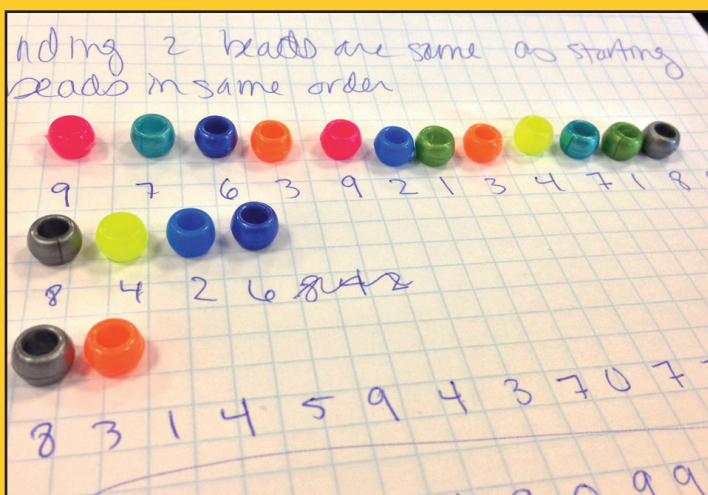
All 21 applicants were accepted. Most were middle school teachers. A few taught lower or upper grades. One husband-and-wife pair taught high school math and science.

The five-day workshop took place in the Bell Cultural Arts Center on campus, in a formal lounge area set up with round tables so teachers could work together in groups. Most days consisted of four one-and-a-half-hour math sessions, broken up by breaks and meals.

Zeitz set the tone after lunch the first day. "That was a highlight, the way he set the stage for getting everyone to believe they could be mathematicians, that



Scenes from the Heartland MTC's summer workshop at the Bell Cultural Arts Center at MidAmerica Nazarene University in Olathe, Kansas.



Scenes from the Southeast Ohio MTC's summer workshop at a new local Holiday Inn Express in Athens, Ohio. From top are pictured Operation Cookie Jar, math bracelets, and Pencilcusa activities.

they're not always going to have answers; that's not necessarily the goal," Brown said.

"The environment was different from the Colorado group, but both groups were just as loose and had just as much fun," Zeitz said. "In both cases, what they had in common was the leaders of the Circles were really very generous. Not in a material way, but generous with spirit and time, and I think it rubbed off on the participants quite a bit."

Each of the team leaders led a math session. "Having enough energy was a challenge," Brown said. "I was excited each day, but it just took a lot out of me. I learned that when you do your first one of these, you should just be a participant, rather than leading a session yourself. Leading the sessions was what I wanted to do, and I enjoyed it, but it just made for shorter nights of sleep."

BRINGING MTC FEVER TO OHIO

Bob Klein of Ohio University, a co-leader of the Southeast Ohio Math Teachers' Circle, wants to establish a statewide network of Math Teachers' Circles.

"Ohio is all abuzz about MTCs right now," he said. His latest application to Ohio Board of Regents, which funded their 2013 summer workshop, requests additional funds to help start new circles across Ohio.

How does he have time for this? "I'm on sabbatical for the semester, but I don't have time for this," Klein said. "It's not so much that it takes time—it just takes excitement."

The Athens, Ohio-based team—which, in addition to Klein, includes middle school teachers Katie Hendrickson and Susan Matters, and math coach Nina Sudnick—brought a lot of excitement and a complementary set of skills to the planning of their immersion workshop.

Matters was largely in charge of recruitment. "We called her our wrangler," Klein said. "She was responsible for wrangling participants. She's in a number of school district and union organizations."

Sudnick, a former fourth grade math teacher who now works full-time as a math coach, helped make sure that the math sessions squarely targeted their intended audience. Hendrickson, meanwhile, created a website where teachers could apply for the workshop.

The group had help with the application process: the Stevens Literacy Center at Ohio University, which administered their grant, also took care of some logistics, including accepting and paying participants.

Participants who attended all four days of the workshop received a small stipend at the end. It was meant less as an incentive as a way to show respect that they were giving up their time.

They considered holding the workshop at a venue outside of Athens, but decided against it, thinking it would be too much to ask teachers to go out of town and leave their families during the summertime. Instead, they picked a new local Holiday Inn Express. Plus, by picking a low-cost venue, they could afford to spend more on food.

“AIM suggests that we try to treat teachers like kings and queens,” Sudnick explained.

Treating teachers well also meant having excellent facilitators and leaders. “Teachers are a pretty tough audience,” Sudnick said. “As soon as it gets boring, you’re going to lose them.”

Klein invited Judith Covington of Louisiana State University at Shreveport to lead a few sessions. A local magician came to do some math-related tricks. Hendrickson, who is working on her Ph.D., also led a session.

Klein also invited some professors from Shawnee State and Ohio State to lead a special session called “Ask a Mathematician.” Teachers were able to ask the professors how they became interested in mathematics, and what they thought about Common Core. “It gave us a chance to say, ‘What do you do? I teach kids math. How did you get into that profession?’” Sudnick said.

The leaders were mindful about tuning the content to their audience. “You don’t want it to be too easy or too hard,” Sudnick said. “Bob really worked hard at making math problems fun, but not a cakewalk. We talked about having the right amount of equilibrium there. We also tried to have problems that we could take back to the classroom.”

The workshop lasted four days. Each day included two problem-solving sessions, complete with pedagogy briefs, in the morning and in the afternoon, separated by an hour-long lunch. At the end of the day, there were wrap-ups and reflections.

One of the best sessions, called Operation Cookie Jar, was something Klein picked up from Gabriella



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Pinter at the Circle on the Road in Puerto Rico. The problem involves 15 cookie jars, numbered consecutively from 1 to 15. The number of cookies in each jar is equal to the number of the jar. A “move” consists of choosing one or more jars, then removing one or more cookies from the chosen jars, but the same number of cookies from each jar. Teachers are asked for interesting math questions, and they explore the number of moves it takes to empty the jars.

“Our teachers just went nuts with that activity,” Klein said.

If the workshop has a lasting impact, Klein believes it is due to the immersion experience. “Math Teachers’ Circles are about collaborative problem solving, and collaborative problem solving in mathematics means putting yourself out there. It’s hard to expose yourself to what you don’t know, to take a risk. The immersion experience made it easier for all of us. That was four days well spent to develop community.”

The other thing it did, he added, was to break down walls of people’s perceptions of the divide between K-12 and higher education. “People would look at me and say, ‘I don’t get this problem. What do you think? Is this right?’ And I’d say, ‘Why don’t you ask your table? I don’t know. Why are you asking me? I’m doing the same problem.’”

Sudnick’s final words of advice, for people thinking of holding an immersion workshop, are to find educators who are jazzed up about math in their schools. “Who are your most engaged teachers? If you get them involved, they will help you engage other teachers.” 