

Recipe for Success

Gathering the Perfect Ingredients for a Great MTC Session

by Joshua Zucker

What makes a good session? As mathematicians, we tend to spend most of our planning time and energy in thinking about what mathematical ideas and strategies we want the participants to work with, and what problems will lead the group to those goals. However, to create and sustain a successful circle, we need to also spend at least as much effort on our thinking about how to use the time we have, how to facilitate interaction and develop community, and what the participants will take away from the experience. Perhaps the most important element is to ensure that every participant feels that their contributions and efforts are worthwhile and valuable.

Leadership

An important part of the goal of MTCs is to bring together mathematicians and middle school teachers. However, there's often still some distance and separation between these two groups. One way to break this down is to have sessions that are co-led by a mathematician and a middle school teacher. Often, the middle school teacher leads the introduction of the problem and facilitates the early discoveries about it, and then the mathematician helps guide the group to see the connections to deeper strategies or to other mathematical topics. This collaboration builds a stronger mathematical community. The middle school teachers are more in control of the process of mathematical discovery, and the mathematicians learn pedagogical strategies and gain insights into how others might experience a problem encountered for the first time.

Efficiency

Starting at the advertised starting time is important, to make everyone feel their time is valued. If you're going to open with some casual socialization before starting

on the math, give people that schedule ahead of time so they know what they're coming for.

The Casco Bay MTC suggests one way to make the start feel important while still allowing latecomers to be brought into the conversation: they warm up with an easier problem, or a game that's on a similar theme, such as a parity game for a session that explores other applications of parity. That way people arriving early can get engaged in the mathematics and later can enjoy discovering the connection between the opener and the main session. Meanwhile, people who arrive late don't miss out on the meat of the session, just the appetizer. Another method is to start with the literal meat instead of the metaphorical, by opening with dinner and some social time, so late arrivers may miss out on the food but not the mathematics!

Attendance

Small groups can work well, but there does seem to be some minimum size, around 10, to make the session feel like a success and make the work you put into planning feel worthwhile. Recruitment can be the hardest part of organizing a session, but it can also be the most rewarding as you bring new people into the culture of problem solving. Summer immersion workshops may be one of the best recruiting tools, but you can make progress with a special one-day intensive workshop sometimes, too. Another great way to help the group grow is to get teachers to bring their friends and colleagues. This not only brings more teachers into your group, but also gives more opportunities for teachers to continue thinking about the mathematics and to collaborate on ways to bring MTC problems into the classroom.

A more formal RSVP process may also help increase attendance. People who reply and register on a simple Google Docs form may be more likely to honor that



commitment, and it's also easier for organizers to send them repeated reminders if they've registered. Some groups, such as Cincinnati, use a Facebook page for their group and announce their events that way, which gives a very easy way of collecting replies.

Participation

Perhaps the most vital element of a good MTC session is that everyone attending should feel like an important participant. The Twin Cities MTC reminds us that a good topic should "have different entry points for those with different backgrounds" and of course all of us understand that a good MTC problem should have a low threshold and high ceiling so that everyone can start and nobody gets bored.

Even though problem selection was discussed in the Winter 2013 issue of MTCircular, it's worth reminding ourselves that less is more: give the participants work to do, things to investigate. Resist the temptation to do more problems and tell them more about the math and the connections. Wait until they need it, wait until they want the mathematics, because they know what they need to continue making progress.

Make sure you have an early punch line so everyone sees at least one important bit (a strategy, a new mathematical idea). The rest can be in a handout that you give at the end of the session, so that you know they can still explore it and you feel less pressured to include those ideas during the session. The handouts can also show extensions to other mathematics or related results, or give a classroom-usable idea on a related topic. Post these on the web so that people at other MTCs can make use of them! The national organization is working on ways to make these handouts easier to find and use, so if you have ideas on how we can do that, please share them with us.

Grouping

Some circles make a deliberate effort to bring new people into the community and to develop new relationships among the attendees. During the course of the session, they form teachers into groups in different ways, sometimes specifically requiring that teachers group with people they haven't met or haven't gotten to know in previous sessions. This is especially important to make the group more welcoming to those who haven't been to a summer workshop, where some participants have already developed strong connections. It can be similarly important for groups like Central Nebraska's, where there is a mix of pre-service and in-service teachers.

Pedagogy

MTC sessions model the pedagogy of problem solving so that teachers can experience it as learners. Many MTCs spend some time discussing pedagogy more explicitly as well. Hawaii, for example, observes two distinct phases in their meetings. First, the participants function as solely mathematical learners, and find that they can stay in that mode more easily when they know that there will be time later for them to reflect on the experience as teachers. The discussion in this second phase includes connections to the Common Core and how to incorporate these problems or related ones into their classrooms, among other things.

Above all, remember that a good session should model the style and practices that we want teachers to use with their middle school students. We want to develop the teachers' ability to use mathematical tools and problem-solving strategies so that they can lead their students in the same direction. Providing clear labels for a small number of key elements of each session can go a long way toward enabling teachers to, in turn, bring the same elements to their students. 🟩