



Moody's Mega Math Challenge™

M3Challenge.siam.org



Advice for coaches from past participants:

Team selection

1. The best students are those who have demonstrated that they are not only good at math, but have an excellent work ethic and are up to the challenge of working all day long on a problem they may find extremely difficult.
2. Try to select students with a variety of key qualities, such as research capability, leadership skills, and writing skills, and look for both logical and outside the box thinkers.
3. Choose a writer, a project manager, a mathematician, a researcher, and a well-rounded student for the team.
4. We selected our team based on the students' ability to work together, open-mindedness, resourcefulness, and strong math and problem solving skills. I also looked for students who were strong willed and undeterred by challenge.
5. Select students who have demonstrated an ability to listen to each other and share in a group. In the previous Challenge, I selected one student with summarization and writing skills, two with outstanding computer programming and math abilities, one with exceptional math abilities, and one with excellent research abilities.
6. I choose students who have the willingness to commit the time to participate. Only a few more students volunteered than we had room for last year. I selected the final ten based on the following criteria: problem solving ability, writing skills, and ability to work well on a team.
7. I ask all of the math teachers to nominate 2 or 3 of their most motivated students. I invite all of the nominees to an information meeting. Students who show the most interest are invited to sign up.

Student preparation

1. In preparation for the Challenge, I assign a scaled down version of the previous year's problem to all of my students. After they have completed that task, I show them the videos of the winning teams presenting their solution papers. They tend to have more confidence in their ability to handle this competition after they see that the Challenge is "doable."
2. Prepare students for the rigor and commitment of the day.

3. The open-ended nature of the problem means the students must perform research to fully understand and define the problem; identify the problems' important parameters; and learn to deal with uncertainty. The large scale of the problem means the students must work as an integrated team to prioritize their tasks and delegate responsibilities so they can complete, document, and write up their tasks in a comprehensive report within a very strict deadline.
4. Remind students that they have to consider facts and statistics, not just opinions, when creating solutions.
5. To help my team prepare for the Challenge, I give them various scenarios, demonstrate modeling techniques, and review the solution papers from past winners.
6. I go over past problems with my students and have them critique the winners' solution papers. Then I ask them to suggest what they would have done with the problem.
7. I teach them other modeling techniques — like basic network theory — and include modeling projects in their calculus curriculum.
8. We meet once a week. I teach them what I can about math-modeling. We also practice solving the sample problems posted on the M³ Challenge website.

Final thoughts

1. Time management is important. Students often spend the majority of their time looking for information. They need to be able to work on multiple aspects of the problem at one time.
2. When our students decided to work at school, we needed to ensure that Internet filters at the school were turned off so the teams would have full access to research the problem topic.
3. Make sure the students check out their equipment in advance. Last year my team made arrangements to work at one of the team member's homes. Unfortunately, they couldn't get one of their laptops to work.
4. Students should familiarize themselves with software or other technology that they could use for data analysis.

See reverse for advice for students.

