How do you get bright students hooked on mathematics? How do you keep teachers intellectually engaged and pedagogically innovative? A proven way is to involve them both in mathematics competitions with great problems that span the curriculum. The Mathematical Association of America has continuously sponsored nationwide high-school level math contests since 1952. The American Mathematics Competitions is now the oldest, largest, and most prestigious STEM competition in the U.S. The competition sequence now has 5 different contests at increasing levels of mathematical sophistication. Students who succeed at the top level on these contests become the team representing the U.S. at the annual International Mathematical Olympiad (IMO). The Mathematical Olympiad Summer Program which is the training program for the IMO team each summer also teaches over additional 50 students deep understanding and problem-solving skills, and most go on to careers in mathematical sciences. I’ll give an overview of the full competition and outreach program. (Received September 17, 2013)