How to run a math camp

organized by
Ellen J. Maycock and Max Warshauer

Workshop Summary

This workshop brought together directors and organizers of summer programs or math camps in the United States. The focus of the workshop was to provide an organized forum for both experienced and new or less-experienced directors to exchange information and ideas about how to run a successful math camp. The workshop was organized by Ellen Maycock, American Mathematical Society (AMS), and Max Warshauer, Texas State University. Also in attendance were the current and former executive directors of the AMS, Don McClure and John Ewing. The workshop was funded by both the American Institute of Mathematics (AIM) and the American Mathematical Society (AMS).

In the proposal to AIM for the workshop, the organizers stated that their goals were to:

- Provide advice and support for individuals who have recently started or are interested in starting a math camp;
- Provide experienced directors an opportunity to share experiences and their knowledge with each other and with new directors;
- Produce a web-based product (e-book) and web site that will provide a "how to" and best practices for starting and maintaining a successful math camp that will touch on a wide range of topics relating to running a math campfrom obtaining funding for a camp to developing challenging, creative and research-oriented mathematics curricula;
- Plan for facilitating a continual exchange of ideas on how to run a math camp after the workshop. This could include a blog, FaceBook page, or perhaps a plan for future workshops or meetings.

The first, second and fourth goals were all met with great success during the three days of the workshop. The discussions were detailed and wide-ranging on many topics of interest to the participants. The workshop was really too short to have a product such as identified in goal three completed. However, one participant does plan to write a book (e.g., "Math Camp in a Box"). Work on a private Wiki will be moved to the AMS web site as it is polished. The organizers are working to establish a network of math camp directors under the auspices of the AMS.

The workshop was held over three days. On each of the first two days, there were two panels attended by the full group as well as several breakout sessions on topics that were of interest to some but not all of the participants. On the third day, there was a general discussion in the morning, focusing on how the group wished to move forward after the workshop, followed by breakout sessions. An "open mic" session, where participants were able to speak

on any topic that hadnt yet been addressed during the workshop, was the final activity of the workshop.

The participants all wished to stay connected and to be able to share information after the workshop. Ellen Maycock has created a private Wiki for the participants to share information and an email alias so that the workshop participants can conveniently email each other. Several participants plan to submit a proposal for a Special Session to be held at the 2014 Joint Mathematics Meetings (JMM). The group also wishes to have an open meeting at the JMM to which all current and potential math camp directors could be invited. When the AMS begins its program of Activity Groups later in 2013, Ellen Maycock will facilitate launching of this group of math camp directors as an AMS Activity Group. Several participants hope that an organized group of math camp directors will be able to better influence funding opportunities by the federal government and private foundations.

One example of the new connections that were made at the workshop is quite promising. We heard from a number of established math camps about how hard it was to identify and bring minority students to their camps. Daniel Zaharopol, of the Art of Problem Solving Foundation, is working to develop talented younger students from the poorest middle schools in New York City (Summer Program in Mathematical Problem Solving or SPMPS). Dans goal is to build a pipeline to the top high school camps, so the connections that he made at the workshop with the directors of these high school math camps is highly important to his work. An offer of funding came from another participant: he has an NSF CAREER grant, whose outreach portion is for funding of travel and scholarships for math camp participants. So the campers who have been prepared by Dan Zaharopol will be able to move onto strong high school camps, with funding!

In conclusion, the AIM-AMS workshop on "How to Run a Math Camp" was highly successful. The workshop connected experienced and novice math camp directors, who were able to share experiences and provide support to each other. The panels and discussion groups covered important topics for all of the directors. The participants expect to remain in touch, both via electronic means and at subsequent mathematics conferences.

Panels

- Curriculum development for a math camp
  - Steve Mauer
  - Glenn Stevens
  - David Kelly
  - Terry McCabe

- How to recruit students, with an emphasis on diversity
  - Dan Shapiro
  - Dan Zaharopol
  - Japheth Wood
  - Wendy Hines (participated electronically)

- Administration of a math camp
  - Max Lieblich

  - Marisa Debowsky
  - Luis Caceres-Duque

- Financing a math camp
  - Glenn Stevens
  - Max Warshauer
  - David Savitt

Discussion topics for breakout sessions

- Activities and daily schedule (all participants discussed this topic in small groups)
- Evaluating your math camp
- Publicity for your math camp
- Advisory board and boards of directors
- Diversity
- Developing pathways
- The big picture
- Goals of your math camp

Topics suggested by advisory board or participants but not chosen

- Role of technology
- Common application
- Sustaining a program over time
- Connecting your math camp to the broader mission of your institution
- Selection process
- Role of counselors

Organizers

Ellen Maycock
Max Warshauer

Advisory Board

Luis Caceres-Duque
Wendy Hines
David Kelly
Stephen Maurer
David Savitt
Daniel Shapiro
Glenn Stevens

Participants

Amy Been
University of Nebraska-Lincoln
All Girls/All Math

Luis Caceres-Duque
University of Puerto Rico. Mayaguez Campus
Puerto Rico Opportunities for Talented Students in Mathematics (PROTaSM)

Cheryll Crowe
Eastern Kentucky University

Marisa Debowsky
Canada/USA Mathcamp

Christina Eubanks-Turner
University of Louisiana at Lafayette

John Ewing
Math for America

Julie Heymann
New York Math Circle
New York Math Circle Summer Program

Wendy Hines
University of Nebraska-Lincoln
All Girls/All Math

Tim Hodges
University of Cincinnati

David Kelly
Hampshire College
Hampshire College Summer Studies in Mathematics (HCSSiM)

Max Lieblich
University of Washington
Summer Institute for Mathematics at the University of Washington (SIMUW)

Lori Mains
American Institute of Mathematics

Trent Maverick
The Girls' Middle School

Stephen Maurer

Swarthmore College
MathPath

Ellen Maycock
American Mathematical Society

Terry McCabe
Texas State University
Texas State University Honors Summer Math Camp

Donald McClure
American Mathematical society

Sage Moore,
Skyline High School
Oakland East Bay Math Circle

David Savitt
University of Arizona
Canada/USA Mathcamp

Karl Schwede
Pennsylvania State University

Daniel Shapiro
Ohio State University
Ross Mathematics Program

Ken Stanley
Du Bois Project

Glenn Stevens
Boston University
Program in Mathematics for Young Scientists (PROMYS)

Max Warshauer
Texas State University
Texas State University Honors Summer Math Camp

Virginia Watson
Kennesaw State University

Japheth Wood
Bard College
New York Math Circle Summer Program

Daniel Zaharopol
Art of Problem Solving Foundation
Summer Program in Mathematical Problem Solving (SPMPS)

Joshua Zucker
American Institute of Mathematics

Math Camps Represented

ALL GIRLS/ALL MATH
Location: University of Nebraska-Lincoln, Lincoln, NE
Web site: http://www.math.unl.edu/programs/agam

Canada/USA Mathcamp
Location: Location varies. Past locations have included Colby College (ME, 2013), University of Puget Sound (WA, 2012), Reed College (OR, 2011).
Web site: http://www.mathcamp.org/

Du Bois Project

Location: Oberlin, Ohio
Web site: https://sites.google.com/site/duboisoberlin/

Hampshire College Summer Studies in Mathematics (HCSSiM)
Location: Hampshire College, Amherst, MA
Web site: http://www.hcssim.org and http://www.yp17.org

MathPath (Ages 11 - 14)
Location: Mathpath, Location varies
Web site: http://www.mathpath.org

New York Math Circle Summer Program
Location: NYU Courant Institute, New York, NY
Web site: http://www.nymathcircle.org/summer

Program in Mathematics for Young Scientists (PROMYS)
Location: Boston University, Boston, MA
Web site: http://www.promys.org

Puerto Rico Opportunities for Talented Students in Mathematics (PROTaSM)
Location: University of Puerto Rico, Mayaguez, Mayaguez, PR

Web site: http://www.ompr.pr/

Ross Mathematics Program
Location: Ohio State University, Columbus, OH
Web site: http://www.math.ohio-state.edu/ross/

Summer Institute for Mathematics at the University of Washington (SIMUW)
Location: University of Washington, Seattle, WA
Web site: http://www.math.washington.edu/∼simuw

Summer Program in Mathematical Problem Solving (SPMPS)
Location: Bard College, Annandale-on-Hudson, NY
Web site: http://www.artofproblemsolving.org/spmps/

Texas State University Honors Summer Math Camp
Location: Texas State University, San Marcos, TX
Web site: http://www.txstate.edu/mathworks