

PROMYS Pathways

Engaging students from underrepresented and underserved populations in creative mathematical activities

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JimFest:

**What, Where and for what purpose is the mathematics in
mathematics teacher education?**

A conference in honor of W. James Lewis

May 30 – June 1, 2024

Lincoln, Nebraska

Three Interconnected Academic Programs

PROMYS for Students

- Founded in 1989
- A six-week summer experience of immersion in mathematics.
- Inspired by the Ross Program (going back to 1957)

PROMYS for Teachers

- Founded in 1991 with key involvement from Dr. Al Cuoco of EDC.
- Teachers work alongside students to explore deep mathematical themes.

PROMYS Pathways

- Founded in 2017
- Builds on PROMYS for Students and PROMYS for Teachers to serve students from underrepresented and underserved backgrounds.

Guiding principles of PROMYS

Since 1989, PROMYS has been sustained and enriched by two guiding principles:

- An emphasis on **mathematical habits of mind** that support independence and creativity in facing unfamiliar mathematical challenges; and
- a belief that mathematics is **a deeply human activity** best experienced within a richly interacting and mutually supportive community of learners including high school students, teachers, undergraduate and graduate students, and experienced mathematical researchers.

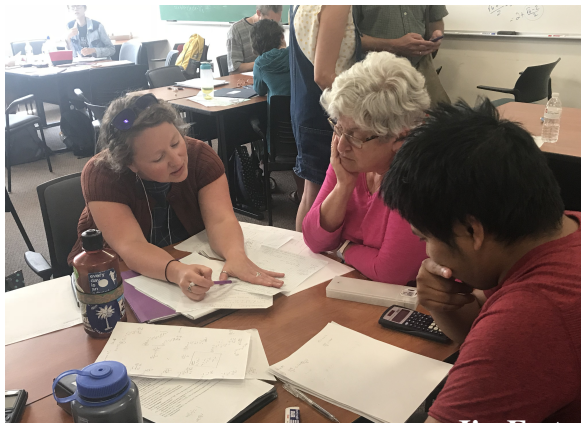
The PROMYS Immersion Experience

The core PROMYS program is an **immersion experience** of mathematics.

- Six weeks in the summer
- **Everyone is a mathematician**
- Intensely personal engagement in mathematics
- Depth over breadth
- Experience before formality
- Necessity for communication
- Innovation and independence of thought, not just in mathematics
- Questioning answers
- **Growth within a multi-layered community of “mathematicians/students/teachers”**

PROMYS for Teachers

- **Director: Professor Caleb Shor**, Department of Mathematics at Western New England University.
- PFT welcomes about 20-25 teachers to Boston University each summer.
- Teachers attend lecture alongside the PROMYS students and work on the same problem sets in parallel.



PROMYS for Teachers Academic Year Workshops

We run up to five academic-year professional development seminars for teachers. Previously, these were run at EDC. In recent years we run these at Boston University and sometimes online. Participation remains high.



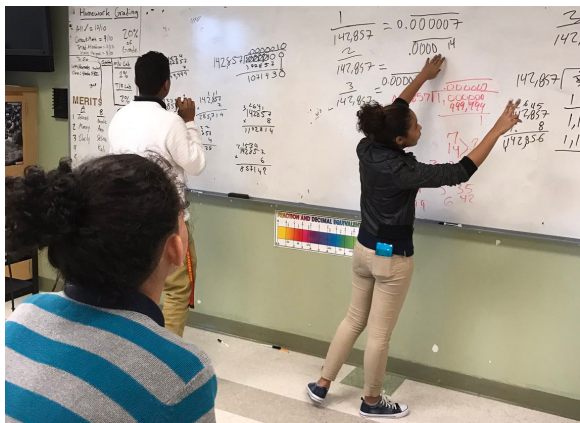
PROMYS Pathways

PROMYS Pathways draws on the PROMYS Teacher alumni to create a community in which students from historically underrepresented backgrounds can have mathematical enrichment experiences that encourage them to pursue further pathways in STEM, including the PROMYS Immersion Program itself. The Pathways program has four overlapping strands:

- **Extracurricular math circles** facilitated by PROMYS for Teachers alumni or other PROMYS-trained mentors,
- **Collaborative mathematical events and field trips** in which Pathways students from different schools can meet and interact,
- **The Pathways Summer Program** – a free 4-week day program that immerses students in deep mathematical explorations and problem solving, and
- **Special support** for Pathways students to apply to the summer PROMYS Immersion Program and/or other STEM programs.

PROMYS Math Circles

- Now starting its seventh year, PMC grew out of a desire to build a pipeline of low-income and underrepresented students to PROMYS.
- We run up to 10 weekly math circles per year in MA schools.



Collaborative mathematical events and field trips

A field trip to the Museum of Math in New York City in 2017



Collaborative mathematical events and field trips

A Guest Lecture by John Urschel at Boston University



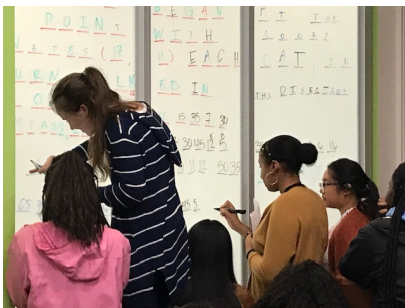
Collaborative mathematical events and field trips

Boston University students share mathematics they are doing in college.



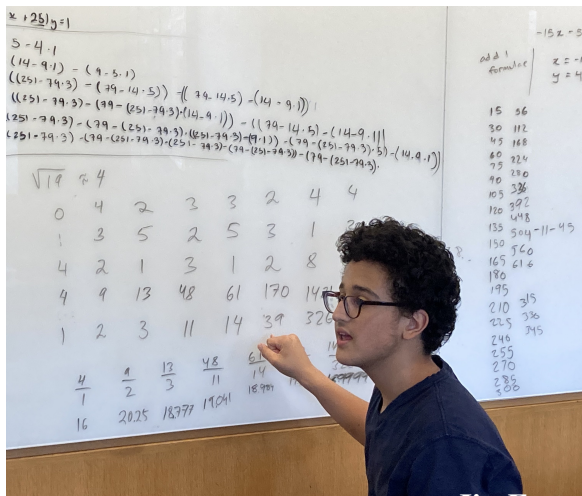
Collaborative mathematical events and field trips

Group Puzzle-Solving with special guest Ken Fan



PROMYS Pathways Summer Program

- Every summer since 2017, PROMYS has welcomed eager Pathways students to a special 4-week summer Pathways program. Some have returned to experience the full immersion experience in future summers.



PROMYS Pathways Students in 2017



... and in 2018.



PROMYS Pathways Summer Program

- After the 2019 program we threw an end of summer Pathways Party



Then came ...

The Pandemic!

A full-time Director of PROMYS Pathways

- **David Fifty** recently accepted our offer of a full-time position as Director of PROMYS Pathways at Boston University.
- David earned his PhD in Mathematics Education from the University of New Hampshire in 2021 and was a postdoctoral research scholar at University of Oregon before joining us in February of this year (2024).

Preparing for a strong future

- **Student Outreach:** Meeting directly with students to talk about Pathways and recruiting for the summer program (e.g., at the MIT Blueprint event and at the Excel Academy Charter High School Summer Opportunities Fair).
- **Building the Summer Pathways Program:** 24 students have signed up for this summer, with several on a waiting list, and four counselors.
- **Networking:** Connecting with other programs (e.g., Mass Insight, LEAP, Boston & Beyond, Math Circle of Chicago/Doug O’Roark) and teachers.
- **Math Enrichment Week (June 24-28) at the main branch of the Boston Public Library:** Daily math enrichment programming for teens with a new host each day. Reaching out to new potential collaborators, teachers, and students.

Thank You!