

# Ohio Mathematics Initiative – Outreach Group

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## About the Ohio Mathematics Initiative

The Ohio Mathematics Initiative (OMI) is a collaborative effort of mathematics faculty members from the state's public colleges and universities and Ohio high schools that is revisiting and rethinking mathematics courses and curricula and the relationship of mathematics to other disciplines.<sup>1</sup>

## About Us

At the OMI meeting in April 2020, the representatives of several institutions expressed their interest in collaborating in a statewide math outreach program. Each institution nominated an outreach representative and the group was born.

## Goals

The central goal of this initiative is to increase the presence of underrepresented groups in mathematics higher education.

In order to achieve that, we believe we need to accomplish the following objectives:

- Create a network of Ohio higher education institutions in math doing outreach.
- Create connections between higher education math faculty and K-12 teachers and students.
- Engage K-12 students with mathematics and expose them to mathematics they may not see in the classroom, including applications.
- Promote mathematics research opportunities for high school and undergraduate mathematics students.
- Establish more inclusive environments in mathematics departments.
- Increase community awareness of what mathematics is and what mathematicians do. Including the adults in the community is crucial since kids' minds are shaped by those adults. Moreover, we need to get families and teachers on board so they can support the students in considering math-related careers.

## Underrepresented Groups

The populations we are focusing on are:

- Women
- Blacks or African Americans, Hispanics or Latinxs, American Indians or Alaska Natives
- Persons with disabilities

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<sup>1</sup> Taken from <https://www.ohiohighered.org/math>

## Plan of Action

### Exploration Phase

In order to achieve those goals, we believe we first need to appropriately explore and assess the problem<sup>2</sup>, i.e. to measure the extent to which underrepresented groups are absent from research careers in math. This will help us better determine where we need to start as well as garner support from our institutions and other relevant entities.

For this assessment, we need data. Some of it is already available from NSF (minorities in STEM<sup>3</sup>) and from the Ohio Department of Education (student diversity in higher education<sup>4</sup>), but we need more specific data about students in math.

Thus, the first task for the members of this group is to try to get that data from the appropriate office in their institution.

Ideally, we would want to have data covering the following aspects:

- Application
- Acceptance
- Change of major
- Drop-out

each broken down by:

- Major
- Sex
- Race
- Income level (or zip code as indirect indicator of income level)

It would also be desirable to survey at least some of the current students from underrepresented groups about their experiences, the obstacles they might have encountered and perhaps still face. Some tentative questions for the survey are:

- What inspired you to pursue a career in math?
- Was there anything that discouraged you from pursuing a career in math? How so?
- Have you ever thought about changing majors? Why?
- Name one positive aspect of your experience as a math student.
- Name one negative aspect of your experience as a math student.
- Are there any conditions the school could improve to contribute to a better experience to you?

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<sup>2</sup> As suggested in the study *Improving Underrepresented Minority Student Persistence in STEM*, available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5008901/>

<sup>3</sup> *Women, Minorities, and Persons with Disabilities in Science and Engineering 2019*, available at <https://nces.nsf.gov/pubs/nsf19304/>

<sup>4</sup> *Undergraduate and Graduate Student Diversity, Fall 2019, Ohio Public Institutions of Higher Education* [https://www.ohiohighered.org/sites/default/files/hei/Diversity%20Fall%202019\\_0.pdf](https://www.ohiohighered.org/sites/default/files/hei/Diversity%20Fall%202019_0.pdf)

### Post Exploration

Once the exploration phase is completed, these are the activities the group would work on to fulfill our goals:

- Math related professional development opportunities for K-12 teachers.
- Classroom visits to present engaging math activities. This would take place preferentially at schools with big populations of underrepresented groups.
- Workshops on fun math for K-12 students hosted at our institutions' or public facilities like libraries. These workshops would welcome all students, but they would mainly be advertised to underrepresented groups.
- Math summer camps for middle and high school students.
- Research internships for students from middle school to college.
- Follow up with students who are frequent attendees to our activities. Maybe pair them up with a Faculty mentor.
- Reach out to underrepresented groups associations and partner with them to reach their populations and offer workshops.
- Link activities to cultural contexts of significance to the underrepresented groups.
- Invite Faculty who belong to these underrepresented groups to be members of this outreach group and to lead some of the activities, so they serve as role models.
- Keep a database of activities for K-12 students that are good for sparking the interest in math.
- Meet as a group once every two months online to develop our network and share ideas and resources.
- Seek out and share ideas for developing more inclusive practices in our mathematics departments.

### **Next steps**

Concretely, the next steps all the members in the group need to take are:

- Review the lists of schools and choose some to contact and gauge the level of interest.
- Create a list of associations in Ohio focused on different underrepresented groups.
- Contribute to the activities database.
- Contact other higher education mathematics departments in Ohio to invite them to the group, especially those in cities with higher diversity indexes.

**Members**

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