

## Fiscal Year 2018 Progress Report



# Ohio Mathematics Initiative

Rethinking mathematics courses, curricula and their relationships with other disciplines

## A Message from the Chancellor:

In early 2013, after discussions with mathematics faculty and various constituents from across the state, the Ohio Mathematics Initiative was formed to rethink mathematics courses, curricula, and their relationship to other disciplines. Now well into its fifth year, the Ohio Mathematics Initiative is continuing collaboration to increase success for students in the study of mathematics. This was one of the primary charges established by the Steering Committee in its March 2014 report, and it still guides the initiative today.

As I reflect on the successes of the past year, I am encouraged by the work on Quantitative Reasoning as well as the decrease in the number of students needing remedial mathematics coursework. In 2010, 34% of first-time Ohio public college and university students required remediation in mathematics; by 2016, that number had dropped to 25%. But there is more work to be done.

Included in this report is additional information about the ongoing efforts of the Ohio Mathematics Initiative. Current work is being done to expand co-requisite remediation and continue collaboration on courses for high school students making the transition to first-time postsecondary students.

I want to thank our mathematics faculty and other stakeholders who have worked with the Ohio Mathematics Initiative over the past five years. I also would like to thank those who will contribute over the next five years to improving student outcomes and preparing our students for the ever-changing global economy.



John Carey  
Chancellor

*“Now, well into its fifth year, the Ohio Mathematics Initiative is continuing collaboration to increase success for students in the study of mathematics.”*



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# The Initiative in Review



## Ohio Mathematics Initiative

Rethinking mathematics courses, curricula and their relationships with other disciplines

In 2013, at the beginning of the Ohio Mathematics Initiative, the Chancellor of the Ohio Department of Higher Education gave the Steering Committee the following charge:

*To develop expectations and processes that result in each of [Ohio's 36 public colleges and universities](#) offering pathways in mathematics that yield: (a) increased success for students in the study of mathematics, (b) a higher percentage of students completing degree programs, and (c) effective transferability of credits for students moving from one Ohio public institution to another.*

In response, the Steering Committee developed a strategy structured around five essential components:

1. Develop high-quality, entry-level courses and pathways connected to coherent academic programs of study for students majoring in mathematics, other mathematics-intensive majors, and academic majors that are not mathematics intensive.
2. Develop policies and processes that foster effective transfer of course credits while encouraging course innovation on all public campuses.
3. Support constructive engagement of mathematics chairpersons and faculty within campus communities and across campuses to shape curricular policy, improve instruction, and bolster student support and advising.

4. Develop high-quality measures for improving mathematics course offerings and instruction, and collect, analyze, and share relevant data.
5. Improve student success in college-level mathematics courses by aligning postsecondary expectations and high school practice.

Under the direction of the Ohio Mathematics Chairs and Leads Network, five subgroups formed to work collaboratively on each of the essential components. Over the past five years of the initiative, the five subgroups have formed, reformed, adjusted, and re-envisioned their immediate goals as they have completed implementation of various parts of the essential components in their quest to help the Ohio mathematics community achieve the initiative goal.

In the pages that follow you'll see how the subgroups have made progress toward ensuring the goal is met. Highlights from each subgroup, as well as plans for the coming year, are featured and speak to the ability of the mathematics community working collaboratively on the essential components.

# 2017-2018 Collaboration around Essential Components

In fiscal year 2018, implementation of the mathematics pathways continued around the state. Institutions are continuing to create courses in Quantitative Reasoning and the focus has now shifted to the expansion of co-requisite mathematics remediation. Through work of **Subgroup 1**, the 36 public colleges and universities were surveyed to find what has been done, and if there are plans for the future to do anything with co-requisite remediation. The information gathered from the survey was tentatively categorized into three currently existing models for implementation in Ohio: Paired Course Model; 101 Plus Model; and Technology-mediated Model.

Efforts for fostering effective transfer are also continuing through **Subgroup 2**. During fiscal year 2018, the focus was on updating Ohio Transfer Module course descriptions to clearly describe the

Success was delivered at the American Association of Community Colleges national conference in New Orleans, LA. The City University of New York (CUNY) System invited initiative committee members to participate in a panel discussion about mathematics pathways and co-requisite coursework at its first mathematics summit. Initiative representatives provided a pre-conference workshop about active learning and assessment in the Quantitative Reasoning classroom at the spring meeting of the Ohio Mathematics Association.

The faculty of **Subgroup 4**, responsible for data analysis, have been engaged in three activities this past year, including communication with institutions regarding the type of data that will be requested, the 2012-2013 cohort data provided by the Ohio Department of Higher

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learning outcomes in each of the three entry-level courses for the mathematics pathways: Quantitative Reasoning, Introductory Statistics, and STEM preparation. In addition, updated learning outcomes were developed for Calculus I and Calculus II.

An essential component of **Subgroup 3** involves communication within the mathematics community. In the fall of 2017, members delivered an invited address to the Ohio Section-MAA at their meeting held at Ohio University-Eastern Campus. A presentation about Marion Technical College's work with the Ohio Mathematics Initiative and Bridges to

Education, and data for a preliminary analysis of a single institution's results with a Quantitative Reasoning course. The 2012-2013 cohort data represent what was happening before the Ohio Mathematics Initiative (OMI). A rudimentary analysis has confirmed that the data need to be updated before a more in-depth analysis can occur. Ultimately, patterns of retention and graduation as dependent upon attendance patterns and grades will be among the most important items to study.

*(Continued)*

## Less Remedial Coursework Means More College Credit for Ohio Students

In an effort to align secondary and postsecondary expectations, the Ohio Department of Education and the Ohio Department of Higher Education through **Subgroup 5** are collaborating to create an Ohio-specific course to aid students in transitioning from high school to college mathematics, remediation free. The targeted students are high school seniors with remediation needs who have the desire to continue into postsecondary education. An Advisory and a Planning Committee composed of mathematics faculty members representing secondary and postsecondary institutions, curriculum facilitators, and administrators began working on the project during the 2017-18 academic year with work continuing through the summer of 2019. The committees have chosen a Quantitative Reasoning course as the first course to be developed. This course will reinforce and extend algebra, statistics, and number concepts with a focus on the mathematical practices. It will emphasize reasoning, problem-solving, and applying mathematics in real-world contexts.

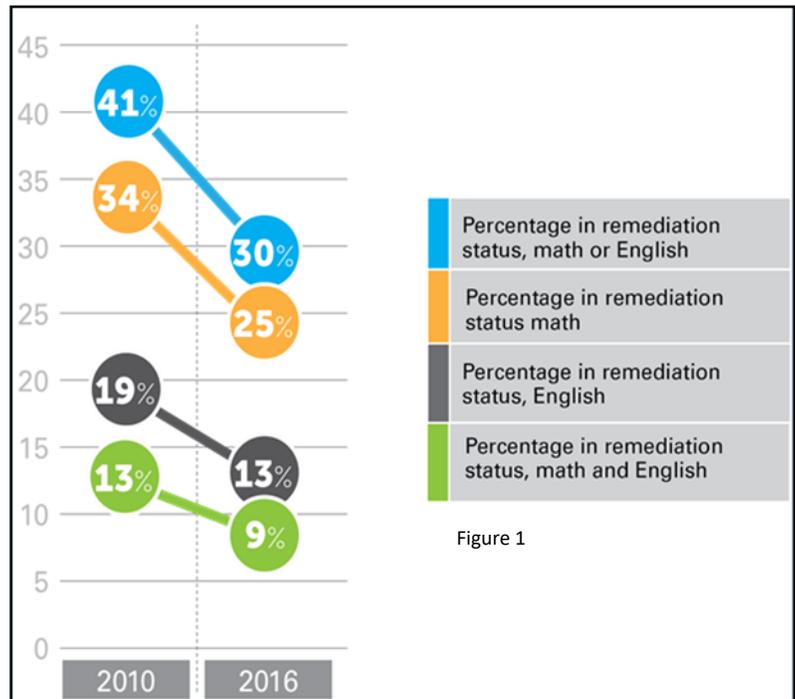
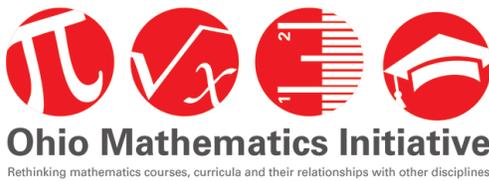


Figure 1

Figure 1: The need to enroll in non-credit-bearing remedial coursework adds time and expense to a student's higher education journey. Ohio's multiple higher education efforts – including statewide initiatives to enhance academic and career advising, the encouragement of college placement practices, such as co-requisite remediation, that support student success, and development of a nationally recognized, performance-based funding formula – revolve around increasing the number of students who successfully complete a college degree or certificate. The 2016 high school graduating class continues a positive statewide trend of fewer students needing remedial mathematics and English courses, which equals less time and money spent at a college or university and a quicker transition to the workforce. The graph above represents the percentage of first-time Ohio public college/university students requiring remediation by subject area.

## Ohio Guaranteed Transfer Pathways

The Ohio Guaranteed Transfer Pathways (OGTP) initiative is working to build seamless transfer pathways so that any associate degree from a state institution of higher education can be transferred and applied to a bachelor's degree in an equivalent field without unnecessary duplication or barriers. An important part of creating a seamless transition is ensuring that students are taking the appropriate mathematics course. For this reason, Subgroup 3 provided representatives to discuss the Ohio Mathematics Initiatives with the faculty panels convened to develop the OGTP. In turn, the OGTP faculty panels utilized the work of the Ohio Mathematics Initiative to identify a preferred mathematics course for each discipline. Collaboration between OGTP and OMI will be ongoing, both to determine if additional mathematics pathways are needed and to educate faculty about the preferred mathematics pathways utilized in the OGTP.



## Strong Start to Finish

In February 2018, Strong Start to Finish awarded a three-year grant to the Ohio Department of Higher Education, in collaboration with the Inter-University Council (IUC), the Ohio Association of Community Colleges (OACC), 18 community colleges, and 12 universities. The Ohio Strong Start to Finish goal is to significantly increase the number of students completing gateway mathematics and English courses as part of a guided pathway within their first academic year. **Subgroup 1** has firm connections to Ohio Strong Start to Finish as many of their projects align closely. This alignment allows both working groups to better understand and identify efficiencies as well as areas for growth. Learn more about Strong Start to Finish [here](#).

On October 26, Subgroup 1 is organizing a **Symposium on Co-Requisite Math**. This symposium, sponsored by the Ohio Bridges to Success Initiative with support from the Helmsley Foundation, will help institutions identify ways to scale co-requisite strategies for students to be successful in math and persist to a degree. Ohio colleges and universities are being encouraged to bring cross-cutting institutional teams to consider opportunities and needs regarding math course design; alignment of math competencies to various majors and degrees; adapting registration systems and processes for co-requisite courses; and advising students.

[Register](#) for the symposium by October 19.

**Subgroup 2** will be working to draft learning outcomes for Early to Middle

Childhood Education in the next year. Additionally, a survey is currently being developed to send to institutions to learn more about how they're teaching calculus courses. This is in support of exploring re-sequencing of calculus. The subgroup is exploring the area of technical mathematics and how this may impact the work of the OGTP. Finally, QR work continues with a project proposal out to determine if a QR library should be developed.

New Fast Facts and webinars are both being planned by **Subgroup 3** for the coming year. Possible topics include College Credit Plus, co-requisite course information and data, and open educational resources. The subgroup will also be exploring how to reach more colleagues, including department chairs who are having conversations on their campus related to pathways.

**Subgroup 4** will be working to explore the barriers related to institutions not having a common language for data collection. The group will pilot co-requisite labs in College Algebra after learning from the QR course. The data accrued in the last year is guiding the planning and development of those labs.

**Subgroup 5** will continue to work with secondary and postsecondary mathematics faculty members to develop the Quantitative Reasoning course for high school seniors who have not yet met college readiness benchmarks. Faculty members will develop the scope and sequence of the course, prepare model lessons, and gather other resources for classroom teachers. A pre-pilot program is planned for the 2018-2019 school year, with high school faculty members working with higher education faculty collaborators at four high schools across the state. A larger pilot program is expected for the 2019-2020 school year.



For more information about the Ohio Mathematics Initiative,  
visit our website at [ohiohighered.org/mathematics-initiative](http://ohiohighered.org/mathematics-initiative)  
or contact Dr. Paula Compton at:

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