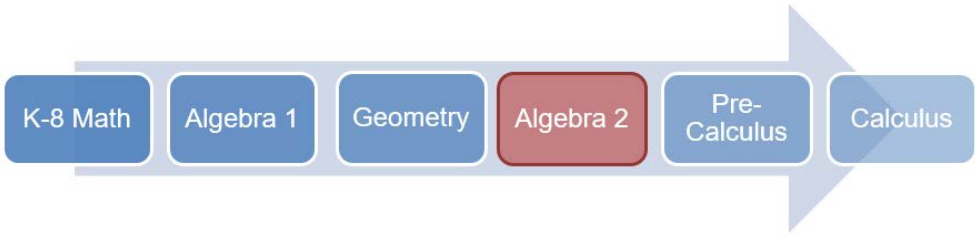
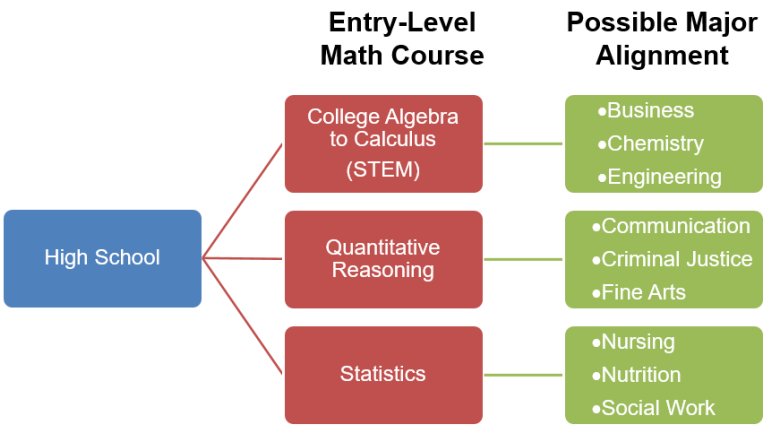
Strengthening Ohio's High School Math Pathways Overview

PROBLEM STATEMENT

Ohio faces an urgent and growing need for educated, credentialed workers. In Ohio and across the nation, the math courses students take help many of them reach their postsecondary goals. But for other students, the same math courses are an impediment, regardless of the relevancy of the mathematical content to their future career. This hinders Ohio from meeting its attainment needs.

Each child is unique with varying goals. There are many paths to success, and each child is capable of succeeding on one or more pathways. Strategy 10 of Ohio's Strategic Plan for Education - *Each Child, Our Future* - stresses **multiple pathways** to future success using multiple ways to demonstrate the knowledge, skills and dispositions needed beyond graduation. Ohio Law requires all students to have a credit in Algebra 2 or its equivalent to graduate, but traditionally there has been only one mathematics pathway available for most K-12 students. Consequently, Algebra 2 is not meeting the needs of all students because it is not relevant for many career pathways. *Note: Students in Ohio also may take the Integrated Math 1, Math 2 and Math 3 path, but the paths are equivalent at the end of Math 2, and the course content of Math 3 is identical to Algebra 2.*





CHANGING LANDSCAPE

Higher education faculty, working with the Ohio Department of Higher Education, have created three different, fully transferable college entry-level mathematics courses to help students progress in their chosen pathway: Quantitative Reasoning, Statistics and College Algebra. This replaces the "College Algebra for all" mentality. Instead, these entry-level courses enable colleges and universities to advise students into the appropriate, relevant mathematics courses based on their majors, rather than the "default" College Algebra (STEM) pathway. *Note: More entry-level math courses currently are being developed.*

GOAL

Because of this, the Departments of Education and Higher Education are partnering with Education Strategy Group, the Charles A. Dana Center, the Ohio Mathematics Initiative and other education stakeholders across the state to rethink Ohio's high school mathematics pathways. The goal is to prepare students for future success by:

- Evaluating the coherence between K-14 mathematics pathways in college and career;
- Rethinking the current Algebra 2 to STEM pathway by leveraging Algebra 2 Equivalency (A2E) to create new pathways; and
- Maintaining rigor in the creation of Algebra 2 Equivalency (A2E) courses and any subsequent courses to ensure equity and flexibility.

Because Ohio law requires students to have a credit in Algebra 2 or its *equivalent*, there is room to expand guidance surrounding the meaning of Algebra 2 equivalency. Equivalence will be defined in terms of the reasoning processes of the standards of the mathematical practices (see text box) underlying Algebra 2 instead of the content standards of Algebra 2.

MATHEMATICAL PRACTICES

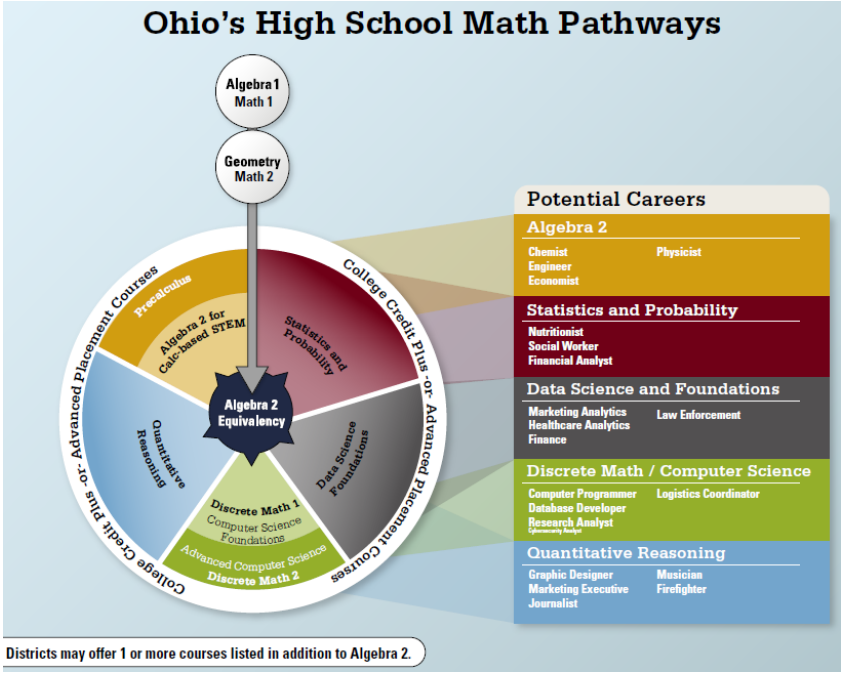
1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

PROCESS

An advisory council, made up of representatives from a variety of education organizations, and the Math Pathways Architects, made up of higher education and high school math faculty, were formed. The advisory council focused on equity, communication and supports surrounding systems and structures. The Math Pathways Architects focused on aligning the math pathways between high school and college and career. Focus groups will give ongoing feedback during the initiative, and a course-specific workgroup will be formed to develop additional resources.

OUTCOME

The Math Pathways Architects designated three to four Algebra 2 equivalent courses: Quantitative Reasoning, Probability and Statistics, Foundations of Computer Science/Discrete Math 1, and Data Science Foundations. Districts could offer one or more Algebra 2 equivalent courses in addition to their current Algebra 2 curriculum; these courses would satisfy the credit needed for Algebra 2.



Note: The potential careers are only a guide, requirements vary by institution.

TIMELINE

Guidance surrounding these courses will be developed and posted on the Department's website in fall 2021 with the ability to implemented by schools in the 2022-2023 school year. However, some of these courses may need to be piloted before all schools have access to the curriculum.

Note: This is still in draft form.