



THE WASHINGTON STATE BOARD OF EDUCATION

An education system where students are engaged in personalized education pathways that prepare them for civic engagement, careers, postsecondary education, and lifelong learning

HIGH SCHOOL AND COLLEGE MATH PATHWAYS

Prepared for the May 2019 Board Meeting

Information item.

As related to:

- | | |
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| <input type="checkbox"/> Goal One: All students feel safe at school, and have the supports necessary to thrive. | <input checked="" type="checkbox"/> Goal Four: Students successfully transition into, through, and out of the P-12 system. |
| <input type="checkbox"/> Goal Two: All students are able to engage in their schools and their broader communities, and feel invested in their learning pathways, which lead to their post-secondary aspirations. | <input checked="" type="checkbox"/> Goal Five: Students graduate from Washington State high schools ready for civic engagement, careers, postsecondary education, and lifelong learning. |
| <input type="checkbox"/> Goal Three: School and district structures and systems adapt to meet the evolving needs of the student population and community, as a whole. Students are prepared to adapt as needed and fully participate in the world beyond the classroom. | <input type="checkbox"/> Goal Six: Equitable funding across the state to ensure that all students have the funding and opportunities they need, regardless of their geographical location or other needs. |
| | <input type="checkbox"/> Other |

Materials included in packet:

- Staff memo
- Informational materials from panelists

Synopsis and Policy Considerations:

The Board will hear from and engage with a panel of K-12 and community and technical college educator panelists, including Dr. Bill Moore, Director of K12 Partnerships, with the State Board of Community and Technical Colleges; Ms. Kerin Keys, Math Faculty, Wenatchee Valley College; Ms. Megan Luce, Math Faculty, Cascadia College; and, Dr. Michaela Miller, Deputy Superintendent, Office of the Superintendent of Public Instruction. Topics of discussion include:

- Bridge to College math courses.
- College math pathways and the potential to align with high school math.
- High school math—in addition to the traditional sequence of algebra 1, geometry, and algebra 2, are there other math courses or sequences that would help student prepare for careers and life, and be acceptable by higher education?
- College math remediation and practices.

This agenda item aligns with the Board's Strategic Plan strategy to study math pathways aligned to specific post-secondary and career pathways.



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Policy Considerations

Math appears in the State Board of Education's (SBE) strategic plan in two places:

1. Under Learning Environments, "the Board supports implementation of emerging and effective practices in the teaching and learning of math."
2. Under Student Transitions & Diploma, a Board initiative is "the study of math pathways aligned to specific postsecondary and career pathways."

At the May Board meeting, the Board will begin work on these parts of the strategic plan through collaborative discussion with a panel of Office of the Superintendent of Public Instruction (OSPI) and postsecondary educators. The Board will be updated on and discuss:

- Bridge to College math courses.
- College math pathways and the potential to align with high school math.
- High school math—in addition to the traditional sequence of algebra 1, geometry, and algebra 2, are there other math courses or sequences that would help student prepare for careers and life, and be acceptable by higher education?
- College math remediation and practices.

Background

MATH GRADUATION REQUIREMENTS AND POSTSECONDARY ADMISSIONS STANDARDS

The SBE has had a long involvement with math as a subject area graduation requirement. The math requirement for the Class of 2019 and beyond is three credits of math: algebra 1 or integrated math I, geometry or integrated math II, and a third credit of math that aligns with a student's High School and Beyond Plan.

For students to be admitted to public baccalaureate institutions in Washington, the minimum college academic distribution requirements (CADRs) are algebra 1, geometry, and algebra 2 or three years of integrated math I, II, and III. Students must also take a math-based quantitative course in their senior year. A quantitative course may be a math course (including algebra 2 or integrated III if taken in the senior year), algebra-based science, AP computer science, or a Bridge to College math course.

Generally, career- and college-ready graduation requirements were designed by the SBE to align with college admission standards so that all high school graduates would have the widest choice of education

and career options after high school. However, through [E2SSB 6552](#), the Legislature directed the Board to remove algebra 2 as a specific graduation requirement. As a result, high school graduation requirements in math align with minimum college admission standards in quantity—3 credits—but not in the content of the third credit of math.

Below is a timeline of changes in the math graduation requirements:

- **Prior to the Class of 2008:** the math graduation requirements were 2 credits of math, the contents of which were not specified (although the general expectation was algebra 1 and geometry) ([WAC 180-51-060](#)).
- **2004:** The Board adopted rules for the Class of 2008 and beyond ([WAC 180-51-061](#)) that specified that the two credits of math align at a minimum with grade level expectations for 9th and 10th grade math learning standards.
- **2007:** The Legislature directed the State Board of Education ([2SHB 1906](#)) to revise high school graduation requirements to have a minimum of three credits, and prescribe the math contents of the three credits.
- **2007-2008:** The Board heard from subject matter experts in K-12 and higher education, examined the graduation requirements of other states, and looked at the varied math expectations for success in a range of career pathways and higher education.
- **2008:** The Board adopted rules for the graduation requirements for the Class of 2013 ([WAC 180-51-066](#)) and beyond that comprised three credits of math for graduating, including Algebra 1 (or Integrated I), geometry (or Integrated II), and Algebra 2 (or Integrated III) or another credit of math; provided that a school representative, the student, and the student’s parents or guardians agreed the course better served the student’s education and career goals.
- **2014:** To implement [E2SSB 6552](#), the Board adopted rules for the Class of 2019 and beyond ([WAC 180-51-068](#)), (with a waiver to delay implementation for 2 years for districts that needed more time) that removed the Algebra 2 requirement, and specified that the third credit of math should be chosen by the student based on the student’s High School and Beyond Plan, with agreement of the student’s parent, guardian, school counselor or principal.

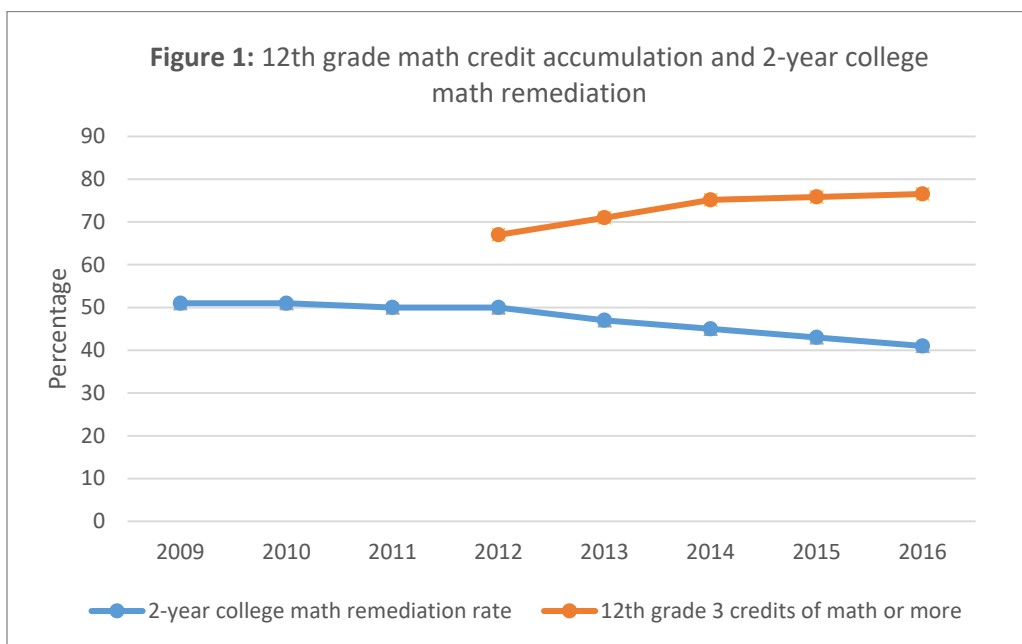
HAVE INCREASING GRADUATION REQUIREMENTS MADE A DIFFERENCE?

Since math graduation requirements increased from two to three credits starting with the Class of 2013, the percentage of students earning more math credits in high school has increased while the percentage of recent high school graduates who enroll in precollege-level (remedial) math in college has decreased.

Figure 1 shows these trends. The upper trend is the percentage of 12th grade students who earned three credits of math or more during high school. As expected, this trend has been increasing since three credits of math became a graduation requirement for the Class of 2013. This math credit accumulation data is from the CEDARS student information system. Not included in the math credits would be courses, such as Career and Technical Education business math, that may count as a third credit of math but would not be transcribed as math courses.

The lower trend is the percentage of recent high school graduates who enroll in a community or technical college, and take pre-college level (developmental) math. These two-year college math remediation rates are from the Washington State Education Research and Data Center P-20 Reports.

These inversely correlated trends suggest that increasing the math graduation requirements have made a positive difference for students. Fewer students have had to spend time and money in college for pre-college math courses.



Part of this outcome may be due to changing college practices in preparing students for college-level work. Nevertheless, it makes intuitive sense that students who take more math in high school will need less remedial or developmental math in college.

BRIDGE TO COLLEGE MATH COURSES

Bridge to College courses were developed by OSPI and the State Board for Community and Technical Colleges, with collaboration between higher education and high school educators. These courses were designed for high school seniors who scored a Level 2 on the Smarter Balanced Assessment. At the time the courses were designed, the Smarter Balanced Assessment was administered to 11th graders.

Washington Community and Technical Colleges agreed that students who earn a “B” grade or above in a Bridge to College course would be considered college-ready and eligible to enroll in college level math courses.

Further information may be found on OSPI’s [Bridge to College webpage](#), and on the [Bridge to College Initiative website](#).

MATH PATHWAYS

Washington’s community and technical colleges are engaged in an [initiative, Math Pathways to Completion](#), to redesign entry-level college and developmental math to create differentiated math pathways to strengthen and support students’ education and career goals. Key problems being addressed by this work includes:

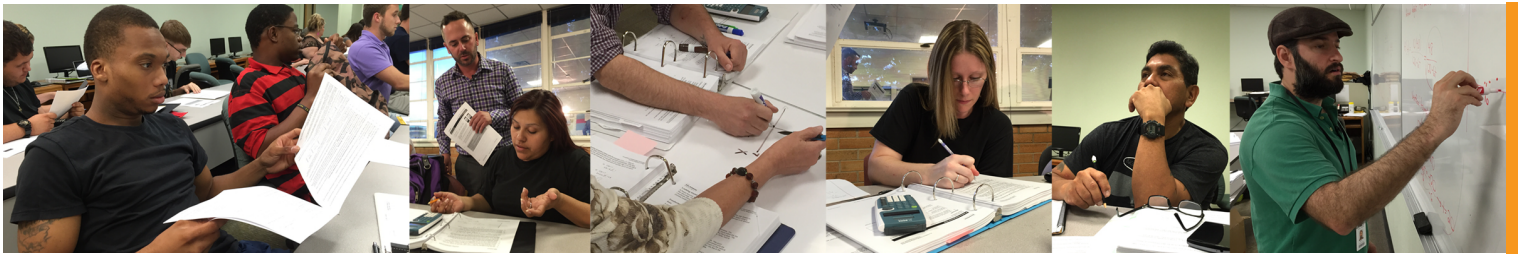
- Aligning the content of college-level mathematics courses to educational/career pathways.
- Creating clear links between precollege mathematics and college level math pathways.
- Incorporating valid and reliable placement procedures while giving students access to intentional advising procedures framed around math pathways.

A team from Washington, including both higher education and K-12 educators, as well as an SBE staff member, will attend a forum in early May, immediately before the May Board meeting. [High School to College Mathematics Pathways: Preparing Students for the Future](#) is sponsored by the Conference Board of the Mathematical Sciences, working in collaboration with the Charles A. Dana Center and Achieve.

At the May Board meeting, members will be briefed on the work of the forum.

Action

The Board will have an opportunity to engage with panelists on topics in high school and college math education, and state efforts to define and strengthen K-12 to higher education math pathways. No Board action is associated with this agenda item.



STREAMLINING THE TRANSITION FROM HIGH SCHOOL TO COLLEGE MATH

DANA CENTER LAUNCH YEARS INITIATIVE

THE CHALLENGE

Across the country, it's far too common that high school graduates are ill-prepared for the type of mathematics they will encounter in college. And too often, well-intentioned efforts to transform high school mathematics have lacked connectivity to the trends in higher education and the changing needs of today's workforce.

Yet we know that students' success in college is greatly influenced by the mathematics they learn, how they learn it, and how they see themselves as a learner and doer of mathematics. That's why we believe it is time to better align the mathematics courses and expectations from high school to postsecondary education.

OUR SOLUTION – LAUNCH YEARS

The Dana Center's Launch Years initiative seeks to usher in a new paradigm to support students, specifically focusing on the transition from junior year of high school to their junior year in postsecondary education. It is this timeframe that's critical in supporting students for college preparation and guiding them through pathways for degree attainment.

The Launch Years initiative is backed by a \$6.68 million grant from the Bill & Melinda Gates Foundation.

COLLABORATORS

Charles A. Dana Center

Since 1991, the Charles A. Dana Center has worked across K-12 and higher education institutions to dismantle barriers to ensure all students—especially those from diverse ethnic backgrounds and low-income families—have equitable access to an excellent education and pathways to prepare for postsecondary and career success.



CCRC has been a leader in the field of community college research and reform for over 20 years. CCRC's work provides a foundation for innovations in policy and practice that help give every community college student the best chance of success.



ESG is a mission-driven consulting firm that works with K-12, higher education and workforce leaders to ensure all individuals obtain credentials of value. ESG works across sectors and across the aisle to move the needle on issues that are critical to improving student success.



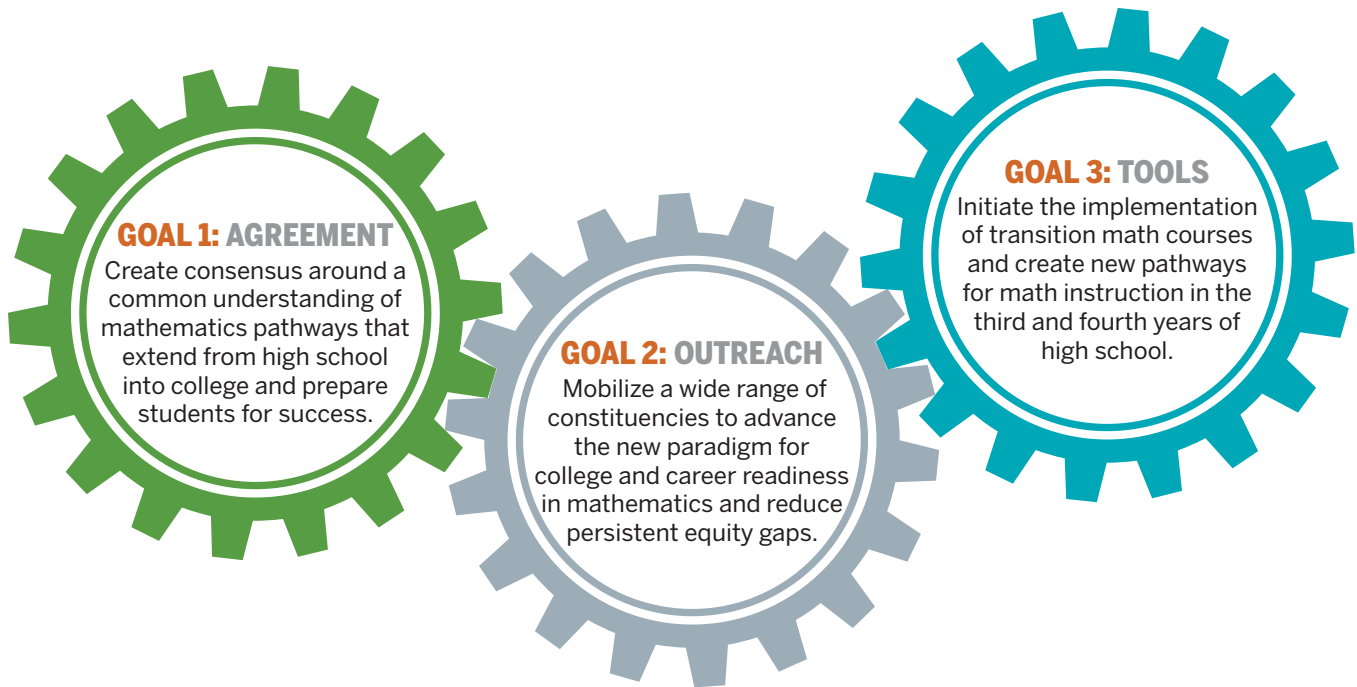
Achieve is an independent, nonpartisan, nonprofit education organization committed to making sure every student graduates from high school ready to succeed. Achieve works with states and partners to design, develop, adopt and implement policies to raise academic standards and graduation requirements, improve assessments, and strengthen accountability.



The Association of Public and Land-grant Universities is a research, policy, and advocacy organization dedicated to strengthening and advancing the work of public universities in the U.S., Canada, and Mexico. APLU's agenda is built on the three pillars of increasing degree completion, advancing scientific research, and expanding engagement.

THE LAUNCH YEARS APPROACH

This multi-year strategy focuses on the ground in several states to assess the high school mathematics students encounter at their schools. It also seeks to bring K-12 and higher education institutions together at a regional level to ensure students have clear paths for success. From these learnings, open access resources will be developed and made available to schools and districts in all states to better support students.



“Focusing on the critical junior-to-junior year timeframe, the Launch Years initiative puts forward a fundamentally new approach to mathematics. It maintains the rigor needed for postsecondary degrees and high-demand jobs, while also creating new pathways for significantly more students — including those traditionally underserved — to thrive in college and realize their dreams.”

Uri Treisman
Executive Director
The Charles A. Dana Center

LEARN MORE

Explore the Launch Years initiative. Learn more about our goals and the challenges we aim to address:
www.utdanacenter.org/launch-years