

The Launch Years Initiative

Developing aligned math pathways across K-12 and higher education

Summary

OSPI is leading an initiative to align high school and higher education math pathways, so that significantly more students—especially those from traditionally underserved backgrounds—can achieve postsecondary success.

Why is the Council discussing this issue?

- The Council identified increasing direct enrollment from high school in its “Enrollment” strategic cluster. Students that are academically prepared are more likely to directly enroll in higher education.
- Preparation for credit-bearing coursework—especially in math—remains a significant barrier for increasing the number of students that earn a postsecondary credential.
- There are significant racial/ethnic and socioeconomic gaps in students’ math preparation and success in higher education that, if not closed, will limit the likelihood of meeting the state’s attainment goal.
- The legislature has invested significant resources into the development of Bridge to College courses to ease the transition for students into postsecondary credit-bearing coursework, and yet a significant number of students continue to struggle.

Why do we need to improve math outcomes to meet the state’s attainment and workforce goals?

1. Preparation for credit-bearing coursework remains a significant barrier for increasing the number of students that earn a postsecondary credential. **National research indicates that students at two-year institutions have about a 1 in 10 chance of attaining a credential in three years if they enroll in a developmental or remedial math course instead of a standard “math 101” course.** The rates are significantly better in courses with co-requisite remedial supports, and yet still far too many students in those courses struggle to attain a postsecondary credential.
2. **Statewide 40% of all students in 2-year/CTC institutions and 10% in 4-year institutions enrolled in remedial coursework in math in 2016.** And significant gaps exist across racial/ethnic and socioeconomic student groups. For instance, among 2-year/CTC enrollees, 51% of Latinx and 47% of Black students enrolled in remedial math coursework, compared to just 36% of White Students. The gaps were similar when comparing free and reduced-price lunch (FRPL) students and non-FRPL students, at 45% and 36%, respectively.

3. Improving math outcomes is also critical for increasing the state’s long-term economic competitiveness. Jobs today—especially well-paying jobs in areas ranging from business to healthcare that will set students on a path to success—require a range of math skills, including analyzing data, interpreting statistics, and making predictions based on mathematical models. According to national research from Burning Glass Technologies, analyzing data and communicating data are two of the fastest growing skillsets identified in job postings across occupations. **In the STEM sector specifically, Washington STEM projects Computer and Mathematical occupations to have the greatest number of annual job openings through 2022.**

Why do students struggle in math?

1. For far too many students, math remains a wall—not a way—to their postsecondary and career success. **A growing body of research demonstrates that traditional developmental sequences and college gateway courses in mathematics serve as barriers to student success.** College Algebra has been the largest gatekeeper for credit-bearing and mathematics requirement fulfillment in postsecondary education. Originally intended to prepare students for Calculus, over time algebra became the default mathematics experience for most students, a majority of whom do not need an algebra-intensive curriculum for the educational program they intend to follow.
2. **For many students, this traditional math pathway is disconnected from their intended academic or career interests.** Students struggle to understand how the content is relevant to their own lives and how they will use the skills in the future. Data indicate that not only is College Algebra not particularly helpful in preparing students for Calculus as it is intended, but also that Calculus itself is not especially relevant to most degrees. Even so, algebra-intensive courses designed to prepare students for College Algebra have been the norm in high schools across the country. Nationally, about 90% of all students complete Algebra II before graduation, and most students that complete a course beyond Algebra II go next to Pre-Calculus, regardless of their intended academic or career plan.

What math do students need to find academic and career success?

1. Students’ different aspirations require different quantitative skills, and this means there should not be a “one-size-fits-all” approach to math. **In response, several Washington higher education institutions have implemented multiple mathematics pathways that offer differentiated, rigorous math options tailored to students’ academic and career goals.** In addition to the traditional Calculus pathway for STEM majors, there is an increasing focus on Quantitative Reasoning and Statistics as pathways that can serve most students.

Both pathways focus on broad mathematical literacy, which is increasingly important for informed participation in our democracy. As the world is transformed by explosive growth in access to large amounts of data, mathematical sensemaking has become fundamental to the healthy functioning of our society. The data sciences and mathematical modeling are increasingly essential across numerous fields, including business operations, sociological studies, and healthcare management and implementation.

What efforts are currently underway to support students’ math success in Washington?

1. Washington has been a leader in the movement to offer multiple math pathways in higher education. Starting in 2015, state leaders engaged with the Charles A. Dana Center at the University of Texas at Austin (Dana Center) to develop recommendations for implementing an expanded set of gateway math courses across institutions.
2. **Beginning in the 2017-18 academic year, 10 Washington higher education institutions formally became the initial cohort of “early implementers.” These institutions agreed to implement math pathways at scale, compile available baseline data on math student enrollment and success and work with SBCTC to track specific metrics over time, and complete an annual program progress report.** The institutions are: Cascadia College, Central Washington University, Clark College, Columbia Basin College, Eastern Washington University, Everett Community College, Spokane Community College, Spokane Falls Community College, Tacoma Community College, and Wenatchee Valley College.
3. **To improve students’ transitions from high school into higher education, OSPI and SBCTC—in collaboration with higher education and high school educators—also partnered to develop Bridge to College transition courses in math (and English).** 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.
4. Through Bridge to College transition courses, students work to gain the skills and knowledge they need to succeed in college-level work. Students who earn a B grade or above in a Bridge to College transition course are considered “college-ready” and eligible to enroll in college-level math and English at all of the community and technical colleges and Eastern Washington University.
5. In the 2018-19 school year, there were 235 educators trained to teach Bridge to College Math in 179 high schools statewide. Based on an impact study from 2018, over 40% of students enrolled in the Bridge to College Math course received a course grade of “B” or better. Students that received these grades were more likely to enroll in postsecondary institutions than the statewide average, suggesting that the course is helping students see themselves as college-capable.

What is the Launch Years initiative?

Building on the work in the higher education sector, the Launch Years initiative seeks to give high school students access to a broader range of rigorous and relevant math courses aligned to their needs, aspirations, and postsecondary paths.

Led by the Dana Center, in collaboration with Education Strategy Group, Achieve, Community College Research Center, and the Association of Public and Land-Grant Universities, the Initiative has three components, each involving cross-sector leaders from K-12, higher education, and workforce at the regional, state, and national levels. Washington, Georgia, and Texas were selected to participate in the Initiative, and representatives from each state are involved in all three components of the work.

Building Consensus

A Consensus Panel made up of state and national K-12, higher education and workforce leaders is working to develop a new vision for math pathways in high school. The Panel will release

recommendations for policy and practice to enact that vision at scale, with the goal of increasing student success and mitigating persistent barriers to equity.

Designing and Implementing Courses

The Dana Center is bringing together educators from K-12 and higher education to develop and support the implementation of two interrelated approaches to high school mathematics: (1) transition to college mathematics (TCM) course and (2) Algebra II-equivalent pathways (A2EPs). In December 2019, a working group released a set of design principles and learning outcomes for a TCM course that reflects higher education multiple mathematics pathways. The Dana Center and Achieve are now engaging with regional representatives in each of the three states to prepare for a pilot of the TCM course starting in Fall 2020.

In the second, the Dana Center is facilitating a working group to create and implement frameworks for course designs and sequences for A2EPs. These pathways will reflect the level of algebraic rigor necessary for all students to be successful in education beyond high school, while also recognizing that typical learning outcomes in Algebra II and Precalculus are not central to the vast majority of postsecondary degrees. These pathways will maintain articulation with higher education by guiding students through both a third- and fourth-year math course aligned with common entry-level higher education math courses and mathematics content relevant in today's economy. Quantitative reasoning, statistics, and data science are strong contenders for shaping the mathematical content of these A2EPs, many of which would conclude with advanced placement or dual-credit follow-on offerings to signal their mathematics rigor and their ability to prepare students for college-level content.

Supporting State Implementation and Scale

Each Launch Years state (GA, TX, and WA) has convened a Steering Committee of K-12, higher education, and workforce leaders to set a vision for multiple, high-quality mathematics pathways in high school that prepare students—especially those from traditionally underserved student populations—for postsecondary success. Education Strategy Group is supporting the Steering Committees in their efforts to identify policies and structures to improve alignment of students' high school mathematics experiences with their college and career aspirations; increase opportunities that can accelerate students' progress toward a credential of value; and, ensure that students, parents, and educators understand the value of math pathways in high school. The Steering Committees are also being asked to identify ways that state education officials, and national partner organizations, can best support and provide cover for implementation efforts. Each Steering Committee is expected to produce a set of public recommendations at the end of 2020 about the policy and programmatic supports necessary to scale high school math pathways.

How can WSAC support this work?

Potential approaches for WSAC to support the Initiative could include:

- Identify key barriers that stand in the way of math success for K-12 and higher education partners to address
- Provide guidance to Launch Years initiative partners and state participants on how to overcome identified structural barriers
- Communicate and gather feedback about the effort among Council members' constituencies

- Recommend ways for lead agencies to engage diverse stakeholders about the work

Questions for consideration

- 1) What do we know about the equity issues in current math pathways across secondary and postsecondary sectors – and how these math pathways impact potential employment and earnings outcomes after completion of a postsecondary credential?
- 2) What can the state learn from the development and implementation of math pathways in higher education to increase the likelihood of success in high school?
- 3) What lessons can be gleaned from the state’s efforts to develop and implement the Bridge to College Math course about how best to support collaboration between high schools and higher education institutions?
- 4) How does the state make sure that successful math pathways can scale to serve all students?
- 5) How can we monitor progress in implementation over time?
- 6) What are the implications for the College Admission Distribution Requirements (CADR) established by WSAC? What are the implications for approaches to multiple measures for placement?
- 7) What role should WSAC play in the work to align math courses and pathways between K-12 and higher education sectors?