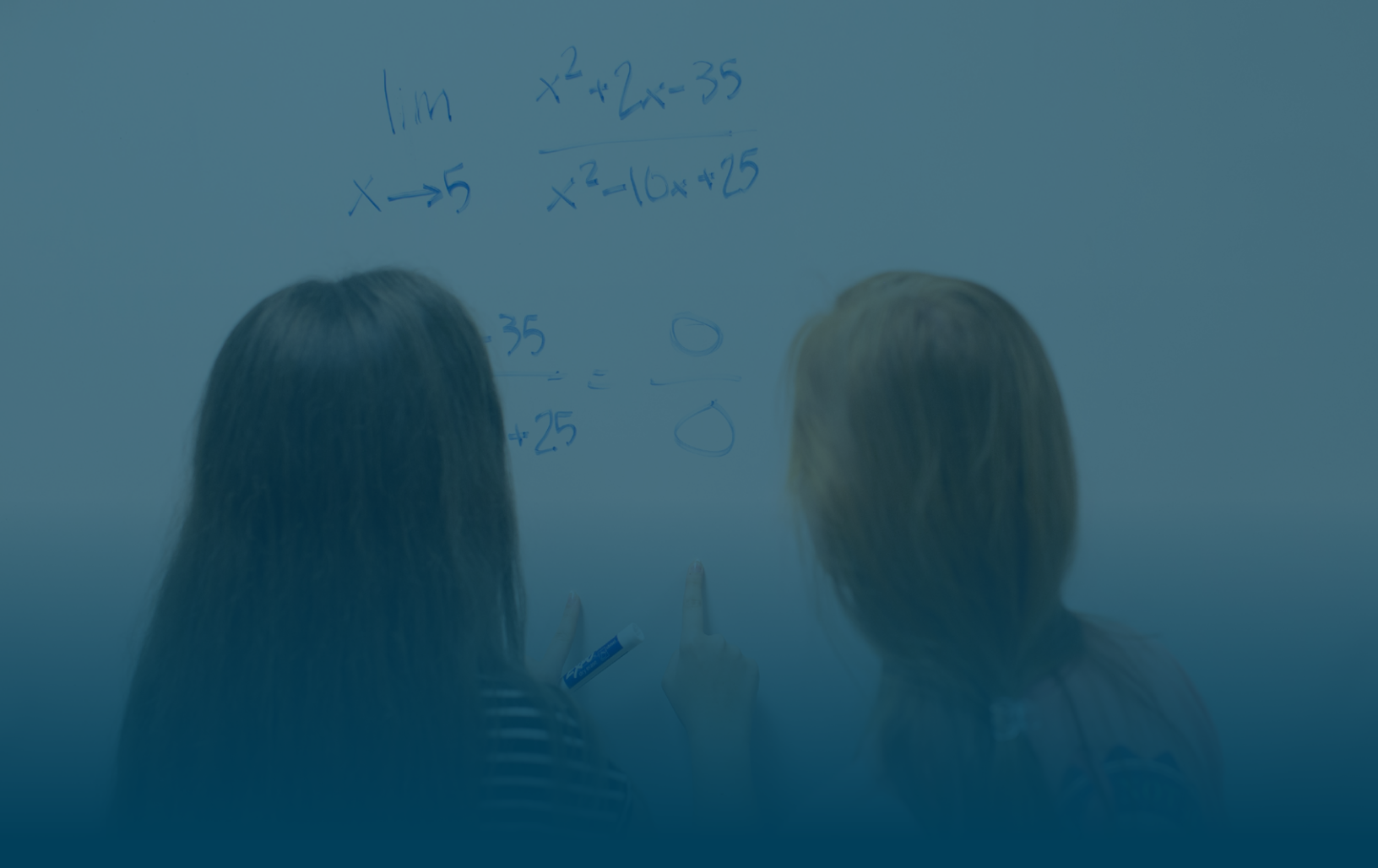

BRIEF

Getting algebra placement right: Expanding opportunity and strengthening preparation

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KEY FINDINGS

- **Many students who are ready for eighth-grade algebra do not enroll.** Among the roughly 25% of students who appear ready for eighth-grade algebra, nearly one-quarter do not go on to enroll in algebra in eighth grade, even when it is available in their school.
- **Students with stronger prior math achievement perform better in algebra when they take it in eighth grade rather than ninth.** For students in the top half of the performance distribution, algebra course performance is higher for those who take the course in eighth grade compared to similar students who wait until ninth grade.
- **For students who are not yet ready, simply waiting until ninth grade is not enough to improve algebra outcomes.** Students in the bottom half of the distribution perform similarly whether they take algebra in eighth or ninth grade, and both groups remain below the algebra proficiency benchmark. These students need additional help to succeed in algebra, not simply more time before enrolling.

Algebra is a critical gateway course in a student's academic pathway. Success in algebra opens access to advanced high school math courses, increases college readiness, and expands opportunities in STEM fields. Because algebra serves as a prerequisite for many advanced math courses, when students take algebra can shape the academic opportunities available to them later. Many districts have expanded access to eighth-grade algebra because completing algebra earlier can open pathways to more advanced mathematics in high school. However, there are long-standing debates about whether (and which) students should take algebra in eighth grade.

As some districts and states have pushed to increase access to eighth-grade algebra, researchers and policymakers have raised concerns that placing a large number of students in algebra before they are ready can cause them to struggle and repeat the course. At the other extreme, some districts restricted access to eighth-grade algebra, arguing that most students would achieve greater understanding of math if they had more time to master foundational skills before taking algebra in high school. These different approaches reflect a shared challenge: balancing access with readiness. At the center of this debate is a key question: **which students benefit from taking algebra in eighth grade versus waiting until ninth grade?**

Using a national sample of 55,000 students with seventh-grade MAP® Growth™ math scores and MAP Growth algebra test scores in either eighth or ninth grade, we examined two related questions.[1] First, how many students appear academically ready to succeed in eighth-grade algebra, and among the students who are ready how many actually enroll? Second, does taking algebra in eighth rather than ninth grade affect algebra outcomes for students who are and are not ready for the course?

1 See the technical appendix that accompanies this brief for more details on the sample and the analytic techniques used in this paper.

Understanding the assessments and benchmarks used in this brief

This brief uses two different MAP Growth assessments to answer different questions about algebra readiness and proficiency outcomes.

	MAP Growth math	MAP Growth algebra
Who is assessed?	Most students as part of regular MAP Growth testing	Students enrolled in an algebra course
Primary purpose	Measure students' general math achievement and growth across grades	Measure students' algebra achievement and growth during the course
How is it used in this brief	Measure students' prior math achievement and estimate readiness for algebra	Measure students' algebra achievement and estimate the likelihood of reaching algebra proficiency

The benchmarks derived from these two assessments are based on NWEA® linking studies that connect MAP Growth scores to state algebra end-of-course proficiency exams.

Algebra readiness: Should this student take algebra?

The readiness benchmark is used **before** students enroll in algebra to help identify students who appear academically prepared for the course. In this brief, a student is considered ready for algebra if their MAP Growth math score is associated with at least a **50% probability** of scoring proficient or higher on a state algebra end-of-course assessment. We use a 50% threshold as a practical benchmark for placement decisions because it identifies students with at least an even chance of meeting state proficiency standards.

Algebra proficiency: Did this student succeed in algebra?

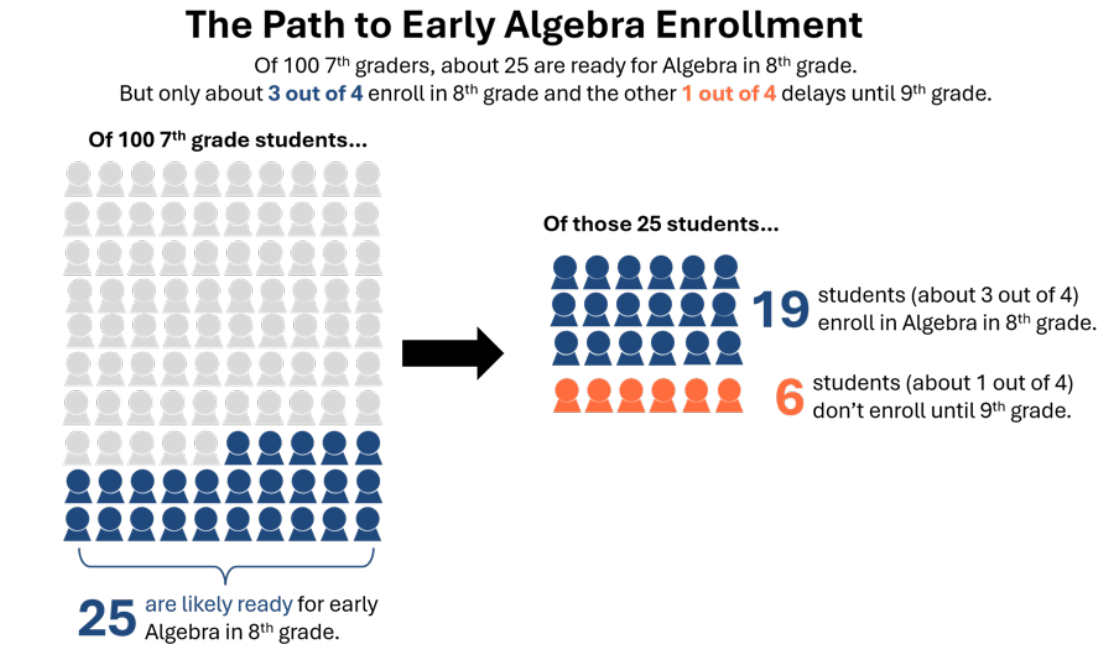
The proficiency benchmark is used **after** students complete algebra to interpret their course outcomes. In this brief, we use students' spring MAP Growth algebra score to evaluate outcomes. The proficiency benchmark represents the MAP Growth algebra score associated with a **90% probability** of scoring proficient on the state algebra end-of-course assessment. Because this benchmark is used to identify students who are highly likely to meet state standards, it uses a more stringent probability threshold.

One in four students are ready for eighth-grade algebra, but many ready students do not enroll

A key question in deciding when students should take algebra is whether they are academically ready for the course. MAP Growth norms and NWEA linking studies provide one way to estimate readiness by identifying the level of math achievement associated with a high likelihood of success in algebra.[2] According to the 2025 MAP Growth norms, about one in four seventh-grade students nationally had spring scores that met or exceeded the algebra readiness benchmark (see callout box for how readiness is defined).

Being ready for algebra, however, does not guarantee the opportunity to take algebra in eighth grade. We examined eighth-grade algebra enrollment patterns among the students who met the readiness benchmark in our sample and attended middle schools where algebra was offered in eighth grade. Even within these schools, nearly one in four students who appeared academically ready for eighth-grade algebra was not taking it (see Figure 1).

Figure 1. Even when students appear academically ready and attend a school that offers eighth-grade algebra, nearly one in four is not enrolled until ninth grade.



Note: Includes only students who attended schools that offered algebra in eighth grade.

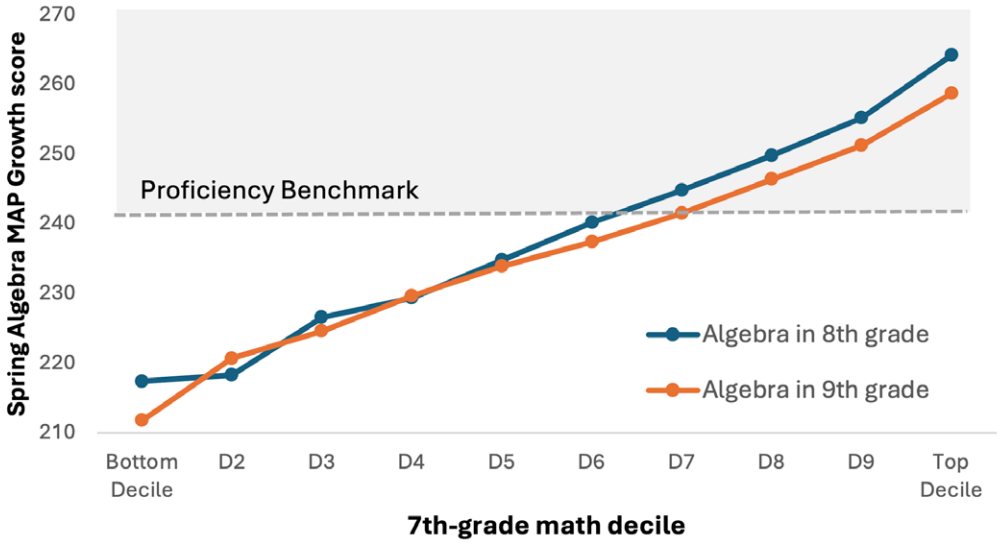
The remaining question is whether the potential benefits of waiting for some students outweigh the potential costs for others. Specifically, is there any disadvantage to delaying algebra until ninth grade for students who were already ready by the end of seventh grade? Conversely, for students who were not ready by the end of seventh grade, does waiting until ninth grade lead to better algebra outcomes? To answer these questions, we compared algebra outcomes for otherwise similar students who differed in whether they took algebra in eighth vs. ninth grade.

2 NWEA has conducted linking studies that connect MAP Growth 6+ math test scores to state end-of-course algebra assessments in Texas, Ohio, Georgia, and North Carolina. Based on the median cut scores across states, we estimate that students who have a spring seventh-grade math RIT score of at least 237 are likely to score proficient or higher upon completion of the algebra course.

Delaying algebra may disadvantage higher-performing students

Figure 2 shows the relationship between end-of-course algebra MAP Growth test scores and seventh grade-spring MAP Growth math percentiles. This is plotted separately for students who took algebra in either eighth grade (blue line) or ninth grade (orange line). The dashed line indicates the algebra proficiency benchmark associated with a high likelihood of scoring proficient or higher on the state end-of-course algebra test. Rather than classifying students as simply ready or not ready based on seventh-grade achievement, this analysis examines how the relationship between algebra timing and outcomes changes across the full range of prior math achievement.

Figure 2. Students with stronger prior achievement perform better when they have earlier access to algebra. For students with lower prior achievement, algebra outcomes were similar regardless of timing.



Note. Results compare students within the same schools within each decile of seventh-grade math achievement. The horizontal line indicates the algebra proficiency benchmark (MAP Growth algebra score ≈241), associated with over a 90% probability of scoring proficient or higher on a state end-of-course algebra 1 assessment.

Figure 2 shows that students with stronger prior math achievement consistently performed better when they took algebra in eighth grade rather than waiting until ninth grade. This advantage was evident across most of the upper half of the achievement distribution, and was largest among the seventh graders in the top decile. Students in the highest decile who took algebra in eighth grade score five points higher than those who took it in ninth grade, which is equivalent to roughly two-thirds of a year of growth for the average student in algebra.

Lower-performing students need more than just additional time

Figure 2 also provides insight into the second question raised earlier: is waiting until ninth grade enough to improve outcomes for students who are not yet ready for algebra by the end of seventh grade?

Based on these data, the answer appears to be no. Students in the bottom half of the seventh-grade achievement distribution had similar outcomes in algebra, whether they took it in eighth or ninth grade. Importantly, lower achieving students remained below the algebra proficiency benchmark regardless of the timing of when they enrolled in algebra. Simply delaying when these students took algebra was not enough to prepare them to reach state proficiency benchmarks by the end of the course.

Summary

One in four students who is ready for and likely to benefit from algebra in eighth grade is not currently enrolled, representing a missed opportunity to support advanced learning. Among students with stronger prior math achievement, those who took algebra in eighth grade generally performed better than similar students who waited until ninth grade. At the same time, students with weaker prior achievement had similar algebra outcomes regardless of when they took the course and remained below the algebra proficiency benchmark in either case.

Taken together, these findings suggest that delaying algebra until ninth grade does not appear to improve outcomes for either group of students: when enrollment is delayed, prepared students appear to do worse and less-prepared students appear to do no better. Instead of universally accelerating or delaying students, schools may be better served by expanding access to eighth-grade algebra for academically ready students while strengthening earlier mathematics instruction and supports for students who are not yet ready.

Implications for practice

These findings suggest several important actions for teachers, school leaders, and policymakers.

Expand access for students who are ready.

First, 42% of schools do not offer algebra in eighth grade. Given the large proportion of students who are ready but not currently given the opportunity to take algebra in eighth grade, districts should examine strategies to adjust course offerings to offer eighth-grade algebra. Researchers, state, and district leaders have noted that it is often possible to offer algebra in eighth grade without high additional costs. If schools cannot offer in-person algebra in eighth grade, they should provide alternatives for high achieving students, such as guidance and support to take online classes, attend virtual high schools, and pursue other enrichment, such as AMC and Math Olympiad competitions. In short, if a school does not offer algebra in eighth grade, the goal should not simply be to delay algebra by a year. Instead, schools should ensure students continue to make strong progress in math by providing opportunities for acceleration, enrichment, or advanced coursework, so they can stay on track for higher-level math.

Second, one in four students who are ready for algebra in eighth grade is not currently enrolled. Delaying algebra can limit achievement for higher-performing students and may reduce opportunities to take advanced math courses later in high school. Schools may want to consider using clear, data-informed criteria, such as automatically enrolling certain students, to expand access while ensuring students are appropriately challenged. Such automatic-enrollment policies have been implemented recently in states such as Texas and Illinois.

Rethink how schools support students who are not yet ready for algebra.

These findings show that simply delaying algebra until ninth grade is often not enough to improve outcomes. Many students in typical eighth-grade math courses make limited progress toward algebra readiness. Districts may need to take a more intentional approach by redesigning pathways and supports to better prepare students. Several promising strategies include:

- **Start earlier with pre-algebra in seventh grade.** Some systems (such as Los Angeles) introduce pre-algebra in seventh grade to build foundational skills sooner, helping more students be prepared for algebra by eighth grade.

- **Offer eighth-grade algebra with stronger, built-in supports.** Instead of waiting, schools can allow students to take algebra in eighth grade while providing additional time and help, such as double-dose algebra periods, tutoring, or targeted interventions, to ensure students succeed.
- **Strengthen eighth-grade math if algebra is delayed until ninth grade.** If students take algebra in ninth grade, eighth-grade math needs to do more to prepare them. This could include more focused instruction, higher-quality curriculum, and additional learning time to build key skills before algebra.

Use data to guide placement decisions

Finally, consistent and intentional use of data should guide placement decisions. Using multiple objective measures (such as seventh-grade performance, state tests, or other achievement tests) rather than subjective measures (such as teacher recommendations or parent advocacy) can help schools ensure that students are neither overlooked for advanced opportunities nor placed into courses before they are prepared. Proactively seeking out students who are ready is the very definition of a strengths-based use of assessment data. Thoughtful placement practices combined with stronger instructional supports can reduce missed opportunities, promote more equitable access to advanced math, and better position all students for success in high school and beyond.

ABOUT THE AUTHORS

Dr. Megan Kuhfeld is director of growth modeling and data analytics at NWEA. Her research seeks to understand students' trajectories of academic and social-emotional learning (SEL) and the school and neighborhood influences that promote optimal growth. Dr. Kuhfeld completed a doctorate in quantitative methods in education and a master's degree in statistics from the University of California, Los Angeles (UCLA).

Dr. Daniel Long was a senior research scientist at NWEA when this research was conducted. His research focuses trends and sources of racial/ethnic and income inequalities on education, inequalities in gifted identification practices, and pedagogies that best help advanced learners. Before joining NWEA, Dr. Long was an assistant professor of sociology at Wesleyan University, director of quantitative research at Research for Action, research director at Connecticut Voices for Children, and research scientist at the National Center for Research on Gifted Education. He has a PhD in sociology from the University of Wisconsin, Madison.

Dr. Scott J. Peters was the director of research consulting partnerships at NWEA when this research was conducted. His research focuses on educational assessment and data use, gifted and talented student identification, equity within advanced educational opportunities, and effectiveness of educational policy. Prior to joining NWEA, for 13 years, Dr. Peters served as a professor of assessment and research methodology at the University of Wisconsin—Whitewater. He received his PhD from Purdue University in educational psychology and applied research methodology.

About NWEA

For more than 40 years, NWEA has been a pioneer in educational research and assessment methodology with a focus on improving learning outcomes for every student. NWEA continues this discovery through dedicated research that explores foundational issues in education, practical challenges in today's schools, and the evolving role of technology in the lives of students. As a mission-based educational research organization, NWEA priotizes a research agenda that reflects our commitment to attacking big challenges in education and measurement and empowering education stakeholders with actionable insights.

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