

# Factors Associated with Grade 9 Math Success in Denver Public Schools

Denver Public Schools (DPS) is committed to improving all students' success in the transition from middle school to high school, in part by increasing the number of students who receive a passing grade in their grade 9 math course. Success in grade 9 math predicts high school achievement and graduation across the nation. In 2023 nearly one in five DPS students did not pass their grade 9 math course. To inform efforts to support successful high school transitions, this study used data from DPS to identify factors strongly associated with grade 9 math success for all DPS students and for student groups that may be at risk of unsuccessful transitions. The study team considered an association to be strong if it was both statistically significant (unlikely to happen by chance) and if a change in the factor was associated with at least a 5 percentage point difference in the likelihood of math success.

## Key findings

- **Receiving any suspension in middle school was strongly associated with being unsuccessful in grade 9 math.** The strong negative association between being suspended in middle school and grade 9 math success was larger than the association for any other single factor, including prior achievement. Attending a middle school with an above-average suspension rate was not associated with grade 9 math success, suggesting that students' experiences being suspended are driving this relationship rather than school-level suspension rates.
- **Achieving proficiency on the Colorado Measures of Academic Success (CMAS) English language arts (ELA) standardized exam in middle school and failing any middle school math course were both strongly associated with grade 9 math success.** Students who met or exceeded the proficiency benchmark on the CMAS ELA exam in middle school were more likely to succeed in grade 9 math than students who did not, whereas students who received any failing grade in a middle school math course were less likely to succeed than students who did not. Meeting the proficiency benchmark on the CMAS math exam in middle school was also associated with grade 9 math success, but not strongly. This suggests that the types of reading and writing skills that the CMAS ELA exam assesses may be transferrable to grade 9 math success—perhaps to a greater extent than the specific skills covered by the CMAS math exam.
- **Higher attendance in middle school was strongly associated with grade 9 math success.** Higher middle school attendance is likely related to grade 9 math success because it increases the amount of instruction a student receives. Higher attendance may also reflect greater motivation to succeed in school or a more stable home environment. All of these influences could drive better course performance.
- **Attending a high school with above-average Hispanic student enrollment was strongly associated with grade 9 math success for grade 9 students overall.** This association was also strong for Hispanic students, who composed more than half of the students in DPS, but not for other student groups that might be at risk of unsuccessful transitions. For Hispanic students, sharing a similar background with their classmates may lead to stronger friendships and social supports during adolescence, which could improve academic performance.

To build on these findings, DPS might choose to learn more about the mechanisms behind these associations. DPS and other districts focused on successful high school transitions might consider implementing and evaluating an early warning system that identifies students for extra support using factors associated with grade 9 math success.