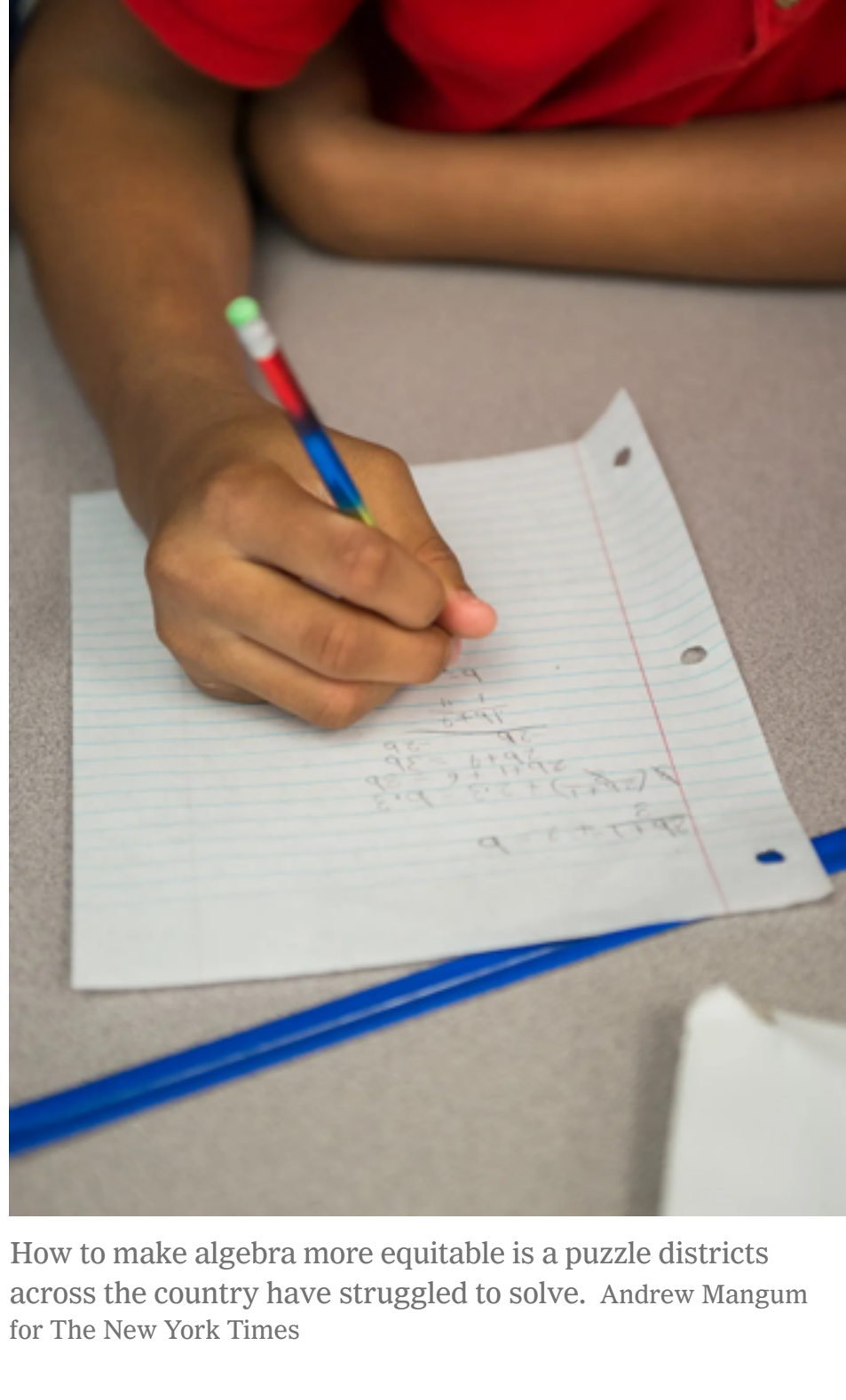


## The Algebra Problem: How Middle School Math Became a National Flashpoint

Top students can benefit greatly by being offered the subject early. But many districts offer few Black and Latino eighth graders a chance to study it.

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How to make algebra more equitable is a puzzle districts across the country have struggled to solve. Andrew Mangum for The New York Times



By Troy Closson

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From suburbs in the Northeast to major cities on the West Coast, a surprising subject is prompting ballot measures, lawsuits and bitter fights among parents: algebra.

Students have been required for decades to learn to solve for the variable  $x$ , and to find the slope of a line. Most complete the course in their first year of high school. But top-achievers are sometimes allowed to enroll earlier, typically in eighth grade.

The dual pathways inspire some of the most fiery debates over equity and academic opportunity in American education.

Do bias and inequality keep Black and Latino children off the fast track? Should middle schools eliminate algebra to level the playing field? What if standout pupils lose the chance to challenge themselves?

The questions are so fraught because algebra functions as a crucial crossroads in the education system. Students who fail it are far less likely to graduate. Those who take it early can take calculus by 12th grade, giving them a potential edge when applying to elite universities and lifting them toward society's most high-status and lucrative professions.

But racial and economic gaps in math achievement are wide in the United States, and grew wider during the pandemic. In some states, nearly four in five poor children do not meet math standards.

To close those gaps, New York City's previous mayor, Bill de Blasio, adopted a goal embraced by many districts elsewhere. Every middle school would offer algebra, and principals could opt to enroll all of their eighth graders in the class. San Francisco took an opposite approach: If some children could not reach algebra by middle school, no one would be allowed to take it.

The central mission in both cities was to help disadvantaged students. But solving the algebra dilemma can be more complex than solving the quadratic formula.

New York's dream of "algebra for all" was never fully realized, and Mayor Eric Adams's administration changed the goal to improving outcomes for ninth graders taking algebra. In San Francisco, dismantling middle-school algebra did little to end racial inequities among students in advanced math classes. After a huge public outcry, the district decided to reverse course.

"You wouldn't think that there could be a more boring topic in the world," said Thurston Domina, a professor at the University of North Carolina. "And yet, it's this place of incredibly high passions."

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"Things run hot," he said.

In some cities, disputes over algebra have been so intense that parents have sued school districts, protested outside mayors' offices and campaigned for the ouster of school board members.

Teaching math in middle school is a challenge for educators in part because that is when the material becomes more complex, with students moving from multiplication tables to equations and abstract concepts. Students who have not mastered the basic skills can quickly become lost, and it can be difficult for them to catch up.

Many school districts have traditionally responded to divergent achievement levels by simply separating children into distinct pathways, placing some in general math classes while offering others algebra as an accelerated option. Such sorting, known as tracking, appeals to parents who want their children to reach advanced math as quickly as possible.

But tracking has cast an uncomfortable spotlight on inequality. [Around a quarter](#) of all students in the United States take algebra in middle school. But only about 12 percent of Black and Latino eighth graders do, compared with roughly 24 percent of white pupils, [a federal report found](#).

"That's why middle school math is this flashpoint," said Joshua Goodman, an associate professor of education and economics at Boston University. "It's the first moment where you potentially make it very obvious and explicit that there are knowledge gaps opening up."

In the decades-long war over math, San Francisco has emerged as a prominent battleground.

California once required that all eighth graders take algebra. But lower-performing middle school students often struggle when forced to enroll in the class, research shows. San Francisco later stopped offering the class in eighth grade. But the ban [did little to close](#) achievement gaps in more advanced math classes, recent research has found.

As the pendulum swung, the only constant was anger. Leading Bay Area academics [disparaged one another's research](#). A group of parents even sued the district last spring. "Denying students the opportunity to skip ahead in math when their intellectual ability clearly allows for it greatly harms their potential for future achievement," their lawsuit said.

The city is now back to where it began: Middle school algebra — for some, not necessarily for all — will return in August. The experience underscored how every approach carries risks.

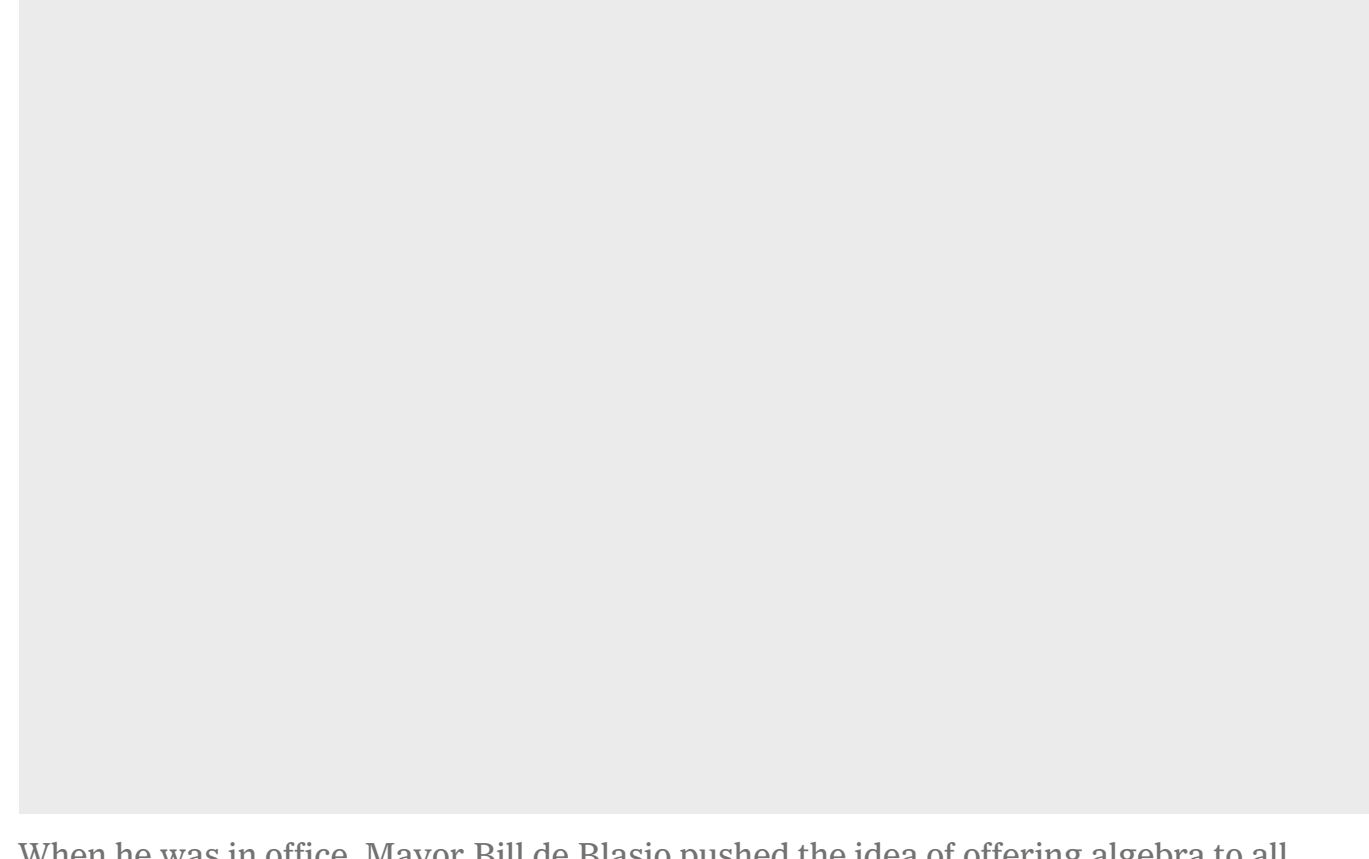
"Schools really don't know what to do," said Jon R. Star, an educational psychologist at Harvard who has studied algebra education. "And it's just leading to a lot of tension."

In Cambridge, Mass., the school district phased out middle school algebra before the pandemic. But some argued that the move had backfired: Families who could afford to simply paid for their children to take accelerated math outside of school.

"It's the worst of all possible worlds for equity," Jacob Barandes, a Cambridge parent, said at a school board meeting.

Elsewhere, many students lack options to take the class early: One of Philadelphia's [most prestigious high schools](#) requires students to pass algebra before enrolling, preventing many low-income children from applying because they attend [middle schools that do not offer](#) the class.

In New York, Mr. de Blasio sought to tackle the disparities when he announced a plan in 2015 to offer algebra — but not require it — in all of the city's middle schools. More than 15,000 eighth graders did not have the class at their schools at the time.



When he was in office, Mayor Bill de Blasio pushed the idea of offering algebra to all students in eighth grade. Hiroko Masuike/The New York Times

Since then, the number of middle schools that offer algebra has risen to about 80 percent from 60 percent. But white and Asian American students still pass state algebra tests at higher rates than their peers.

The city's current schools chancellor, David Banks, also shifted the system's algebra focus to high schools, requiring the same ninth-grade curriculum at many schools in a move that has won both support and backlash from educators.

And some New York City families are still worried about middle school. A group of parent leaders in Manhattan [recently asked the district to create more accelerated math options](#) before high school, saying that many young students must seek out higher-level instruction outside the public school system.

In a vast district like New York — where some schools are filled with children from well-off families and others mainly educate homeless children — the challenge in math education can be that "incredible diversity," said Pedro A. Noguera, the dean of the University of Southern California's Rossier School of Education.

"You have some kids who are ready for algebra in fourth grade, and they should not be denied it," Mr. Noguera said. "Others are still struggling with arithmetic in high school, and they need support."

Many schools are unequipped to teach children with disparate math skills in a single classroom. Some educators lack the training they need to help students who have fallen behind, while also challenging those working at grade level or beyond.

Some schools have tried to find ways to tackle the issue on their own. KIPP charter schools in New York have added an additional half-hour of math time to many students' schedules, to give children more time for practice and support so they can be ready for algebra by eighth grade.

At Middle School 50 in Brooklyn, where all eighth graders take algebra, teachers rewrote lesson plans for sixth- and seventh-grade students to lay the groundwork for the class.

The school's principal, Ben Honoroff, said he expected that some students would have to retake the class in high school. But after starting a small algebra pilot program a few years ago, he came to believe that exposing children early could benefit everyone — as long as students came into it well prepared.

Looking around at the students who were not enrolling in the class, Mr. Honoroff said, "we asked, 'Are there other kids that would excel in this?'"

"The answer was 100 percent, yes," he added. "That was not something that I could live with."

**Troy Closson** reports on K-12 schools in New York City for The Times. [More about Troy Closson](#)

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