



Catalyzing Change in High School Mathematics

Initiating Critical Conversations



About Catalyzing Change

In April 2018, NCTM published *Catalyzing Change in High School Mathematics: Initiating Critical Conversations*. Developed by high school teachers, district leaders, university faculty, and mathematicians, *Catalyzing Change* identifies the vexing issues that have long plagued high school mathematics education. The focus on high school mathematics education stems from the flat high school mathematics achievement over the last 30 years as compared to the progress made at the elementary and middle school levels. The mathematical learning opportunities students have—the content, the learning experiences and the support they receive—need to be examined and changed.

NCTM Makes Key Recommendations in *Catalyzing Change*:

Eliminate student and teacher tracking*

Teach all Essential Concepts in mathematics

Provide engaging and empowering
mathematics instruction for every student*

Offer high school students continuous
and meaningful four-year mathematics
instruction

*Louisiana is implementing these recommendations.

Intensive Algebra 1 Pilot

Jill Cowart, Assistant Superintendent of Academic Content at the Louisiana Department of Education, and Chanda Johnson, Chief of Staff of Academic Content, talk about Louisiana’s work to increase the number of ninth-grade students who successfully complete Algebra 1.

Challenge

A significant percentage of Louisiana’s students were struggling in math, leading to less than 60 percent of ninth-grade students successfully completing Algebra 1 in ninth grade. More than 7,000 of the ninth-grade students, about 13 percent, were not enrolled in Algebra 1 or a higher math course in 2016–2017, preventing them from having the opportunity to even attempt on-grade-level work.

Algebra 1 is a gateway course that not only leads to higher level math courses but also has been shown to predict the probability of students graduating on time. The California Dropout Research Project found that controlling for all other variables, students who passed Algebra 1 by the end of their freshman year increased the odds of graduating on time by more than 75 percent (Silver et al. 2008). Louisiana studied its own graduation data and found similar trends. Recognizing this reality, Louisiana set out to improve the opportunities for its students.

Opportunity

The challenge for Louisiana was to increase the number of ninth graders who successfully completed Algebra 1. In 2017, Louisiana began the development of the Intensive Algebra 1 Pilot. The state determined three elements that were essential for the pilot to be successful:

- High-quality Algebra 1 curriculum with intensive resources that aligned to appropriate prerequisite math work and given to students “just in time” for on-grade-level learning
- Extended time for students
- Teacher support and collaboration

Louisiana worked for more than a year with schools and vendors to develop and implement high-quality curricula with appropriate, aligned supports and wrap-around training. The curriculum options all embody a standards-aligned Algebra 1 curriculum with a robust set of foundational materials.

To accommodate the need for connected prerequisite math work, all piloting schools provided extended time, typically in the form of a two-period time

Intensive Algebra 1 Pilot

block. Some schools did two periods back-to-back, and others split them throughout the day. Schools were required to have the same teacher for the two periods. In a few instances, the schools were able to place all the students in the first hour for prerequisite work and then spread them throughout the day in Algebra 1 so that they were engaging in the on-grade-level work with peers who had not historically struggled with mathematics. In all schools, the extended time was seen as a key component of a successful math experience for these students.

Another key element in the pilot was the ongoing support of the teachers as they learned to use a new curriculum and worked to keep a classroom of students engaged in math for two full periods. Most students had struggled for years in math class, and many exhibited disruptive, defeatist behavior in an effort to avoid doing math. Teachers needed strategic support to manage this behavior and to provide students with opportunities for short-term successes, increasing their willingness to engage in harder math.

Because of the nature of this pilot program, Louisiana requested applications from schools to participate. The Department of Education received tremendous interest in the pilot—applications were submitted for 110 teachers from 50 school systems. This signaled to the state both awareness of the issue and interest in trying creative solutions to help students succeed in Algebra 1.

Results

The results of the initial pilot were overwhelmingly positive. Approximately 2300 students participated in the pilot. The number of pilot students that scored proficient (defined as scoring Basic, Mastery, or Advanced) on the end-of-year exam increased from 33 percent in eighth grade to 65 percent in Algebra 1. For comparison purposes, the percentage of students scoring proficient state-wide from eighth grade to Algebra 1 increased 18 percent. Every school that originally piloted the program determined to continue with Intensive Algebra in 2018–2019. Louisiana is currently working to make Intensive Algebra 1 available across the state to all students who demonstrate significant gaps in mathematical understanding in middle school. Furthermore, the state is taking the positive lessons learned from the Intensive Algebra 1 approach and working with math educators and schools to provide similar supports in earlier grades.

For more information about *Catalyzing Change*, visit www.nctm.org/change or contact David Barnes at dbarnes@nctm.org.

