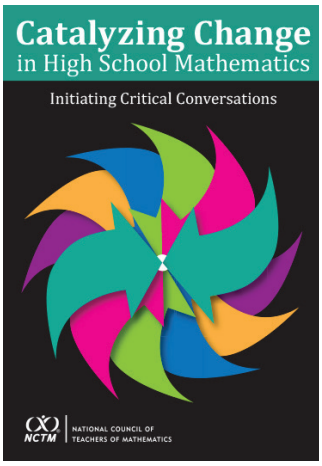

About Catalyzing Change

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

*SFUSD is implementing these recommendations.

Work to End Tracking and Offer Four Years of Meaningful Math Instruction

Lizzy Hull Barnes, Mathematics Supervisor, and Angela Torres, Math Content Specialist, from San Francisco Unified School District (SFUSD), share

San Francisco's work to detrack mathematics by creating heterogeneous math classes in which all students make sense of rigorous mathematics in ways that are creative, interactive, and relevant.

Challenge

Prior to the 2014–2015 school year, all 8th graders in SFUSD took Algebra 1. This resulted in only 22% of these students passing and demonstrating proficiency when they took Algebra 2. In addition, these numbers were disproportionately lower for African American and Latinx students in the school district.

In 2014, the SFUSD school board adopted an ambitious plan to eliminate accelerated middle school math classes and to end the practice of assigning, or tracking, students to developmental math classes. Starting in 2014–2015, SFUSD implemented a heterogeneous mathematics sequence through 10th grade Geometry for all students.

SFUSD knew that this plan would be met with both enthusiasm and skepticism. The developers of the proposal included SFUSD and neighboring district math specialists, national math educators, and district leaders. The decision to move forward to heterogeneous math classes was not taken lightly. SFUSD spent about ten months reviewing data, research, and the new standards while also holding community meetings and presenting findings. They concluded that this approach would be beneficial not just for students who historically had been underserved but also for those who had consistently excelled in math. SFUSD was committed to no longer separating students in mathematics and to providing high-quality learning experiences to every student. There would no longer be honors or gifted mathematics classes, and there would no longer be Algebra 1 in 8th grade due to the Common Core State Standards for 8th grade.

Opportunity

Teachers and district leaders led the charge to also implement the policy of heterogeneous math classes throughout the Geometry courses.

SFUSD also implemented a new math curriculum, developed by SFUSD teachers, that is built on the understanding that children learn in different ways.

Work to End Tracking and Offer Four Years of Meaningful Math Instruction

It provides multiple paths for each child to access math content. In addition to the curriculum, teachers have been supported with central and site professional development and coaching.

The first three years of the high school math pathway are based on the Common Core's traditional sequence of Algebra 1, Geometry, and Algebra 2. Starting in high school, students may take concurrent math classes, along the same common mathematics pathway, or they can take a compressed course in 11th grade. Students still have multiple options for their fourth year of math, including Precalculus, AP Calculus, and AP Statistics.

Results

The positive impact of detracking has been significant. During the 2018–2019 academic year, the first group of students who experienced these changes are in their senior year of high school. Nearly five years after implementing the new curriculum and detracked course sequence, SFUSD is seeing greater participation in upper level math classes and a decrease in achievement disparities.

Prior to the change in policy, repeat rates in Algebra 1 were extremely high, particularly among minority student groups. The graduating class of 2018–2019 saw a drop in Algebra 1 repeat rates from 40% to 8%. In the 2018–2019 school year, 4660 high school students are taking courses beyond Algebra 2, which is 10% more students than the previous school year. Overall, nearly 30% of the students in high school are taking courses beyond Algebra 2.

This increase in students taking advanced mathematics involves a wide range of students. Nearly all student subgroups tracked in 2018 showed an increase in the percent of students taking courses beyond Algebra 2 as compared to the previous year. This was true for African American, Asian, Filipino, Latinx, mixed race, Pacific Islanders, and white students. There was also increased participation by girls, English language learners, and students on free or reduced lunch.

These results are encouraging, but there is more work to be done in order to achieve equitable outcomes for all students. SFUSD is seeing more students take advanced mathematics, and it continues to have professional development for teachers focused on equity with specific practices to engage all students in rigorous mathematics every day.

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

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Founded in 1920, the National Council of Teachers of Mathematics (NCTM) is the world's largest mathematics education organization with more than 200 Affiliates throughout the United States and Canada. NCTM supports teachers, leaders, and policy makers to create equitable mathematics learning of the highest quality for each and every students through vision, leadership, professional development, and research.