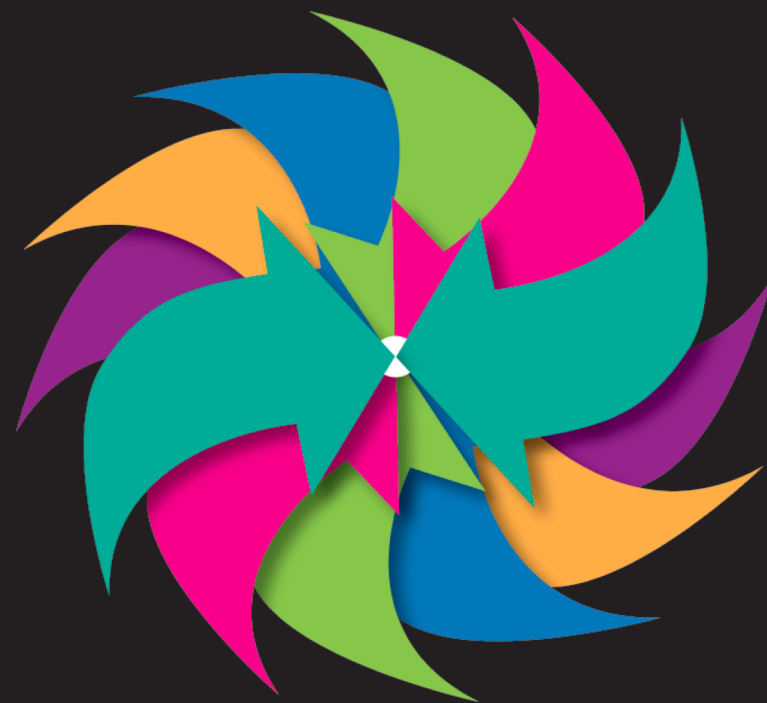


**Why
*Catalyzing Change in
High School
Mathematics?*
Why now?**

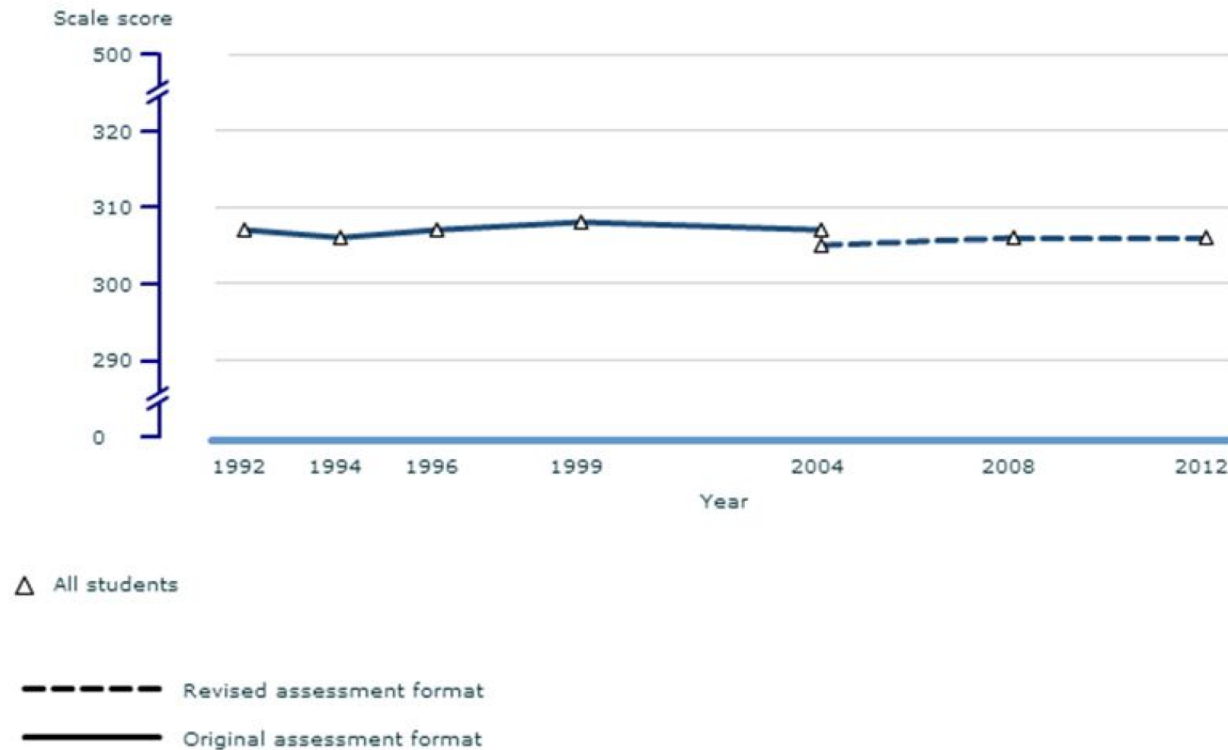
Catalyzing Change
in High School Mathematics

Initiating Critical Conversations



NATIONAL COUNCIL OF
TEACHERS OF MATHEMATICS

NAEP 10 Year Trend Line (Math)



Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1992, 1994, 1996, 1999, 2004, 2008 and 2012 Long-Term Trend Mathematics Assessments.

Making the Case

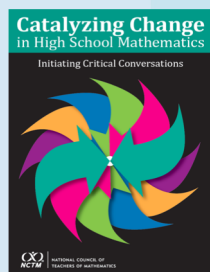
- Program for International Student Assessment shows that U.S. high school students trail their international peers in mathematical literacy (Organization for Economic Cooperation and Development, 2016).
- Young adults lack not only the numeracy and problem-solving skills necessary for meaningful participation in a democratic society (Goodman, Sands, & Coley, 2015).

Making the Case

Despite efforts in the 1990s to change the traditional sequential nature of high school mathematics through the development of five National Science Foundation–funded curricula (St. John et al., 2004), for the vast majority of students today the high school mathematics curriculum continues to begin with a year of algebra followed by a year of geometry and a second year of algebra. This sequence was first recommended by the Committee of Ten in 1892 and remains the course pathway at more than 90% of high schools in the United States (Dossey, McCrone, & Halvorsen, 2016).

Why learn mathematics?

The answer to these challenges is not, as some would argue, simply to require less mathematics (Hacker, 2016); rather, it is necessary to identify, confront, and make long overdue changes to the structures, policies, instructional approaches, and focus and relevance of high school mathematics.



NCTM. (2018). *Catalyzing change in high school mathematics: Initiating critical conversations*. Reston, VA: NCTM.



Four Key Recommendations



- The purpose of learning mathematics and Essential Concepts
 - In most high schools, teachers find it difficult to teach at the desired level of rigor, given the sheer amount of content expected.
- Equitable Structures
 - Too often mathematics teachers are tracked, with the most experienced teachers, assigned to upper-level mathematics courses and the least experienced assigned to entry-level mathematics courses.
- Equitable Instruction
- A Common Essential Concepts Pathway
 - Require clarity and precision in reasoning; significant mathematics learning standards maintain the integrity of the mathematical standards; part of a coherent mathematical learning progression (not dead-end/terminal courses); approach mathematics in an instructionally balanced way

Actions to Initiate Conversations

Teachers, Schools & Districts

- Analyze and evaluate systemic policies, practices, and procedures that restrict student access to and success in mathematics.
- Analyze teachers' assignments to develop balanced and supportive assignments.
- Consistently implement and link research-informed and equity-based instructional practices.

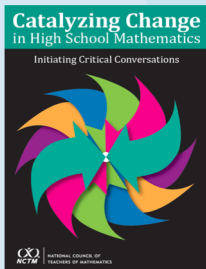
Policymakers

- Develop policies that support meaningful four-year pathways that support student learning of the Essential Concepts as well as additional mathematics
- Developing policies that support the study of mathematics so that all students have professional opportunities, can understand and critique the world, and experience joy and wonder with mathematics
- Deemphasizing the “race to calculus” and increasing the emphasis on developing and using the Essential Concepts
- Developing assessments that are aligned with and emphasize the Essential Concepts

Distinguishing Tracking from Appropriate Acceleration

Appropriate acceleration ensures that ...

- Opportunities are available to each and every prepared student and **no critical concepts are rushed or skipped.**
- Is along a single common shared pathway that provides each student an opportunity to learn the same Essential Concepts.

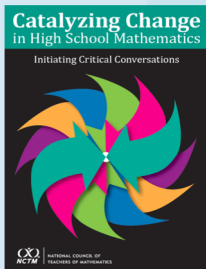


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Distinguishing Tracking from Appropriate Acceleration

Appropriate acceleration ensures that ...

- **Opportunities are open to a wide range of students** who express a higher degree of interest in mathematics, not just those who are identified through traditional assessment instruments.



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