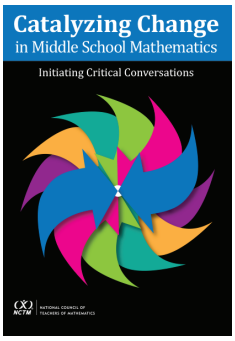

Book Study Guide for

Catalyzing Change in Middle School Mathematics: Initiating Critical Conversations

The purpose of this book study guide is to provide stakeholder groups with a tool to initiate needed critical conversations and actions in middle school mathematics.

Key Recommendations

Catalyzing Change in Middle School Mathematics has proposed four key recommendations that must be enacted to create the highest-quality middle school mathematics program for each and every student that recognizes and celebrates young adolescents.

1. **Broaden the Purposes of Learning Mathematics.** Each and every student should develop deep mathematical understanding, understand and critique the world through mathematics, and experience the wonder, joy, and beauty of mathematics, which all contribute to a positive mathematical identity.

2. **Create Equitable Structures in Mathematics.** Middle school mathematics should dismantle inequitable structures, including tracking teachers as well as the practice of ability grouping and tracking students into qualitatively different courses.

3. **Implement Equitable Mathematics Instruction.** Mathematics instruction should be consistent with research-informed and equitable teaching practices that foster students' positive mathematical identities and strong sense of agency.

4. **Develop Deep Mathematical Understanding.** Middle schools should offer a common shared pathway grounded in the use of mathematical practices and processes to coherently develop deep mathematical understanding, ensuring the highest-quality mathematics education for each and every student.

AUDIENCE

The purpose of this book study guide is to provide stakeholder groups with a tool to initiate critical conversations in their own setting.

FORMAT

The book study guide is designed to support multiple formats, including face-to-face, online, and hybrid settings. The book study guide is organized by chapter. The questions for each chapter can be adapted to best meet the needs of the book study group participants. In addition, facilitators are encouraged to incorporate into the sessions any of the many conversation starters found throughout the book.

BOOK CITATION

National Council of Teachers of Mathematics (NCTM). 2020. *Catalyzing Change in Middle School Mathematics: Initiating Critical Conversations*. Reston, VA: NCTM.

NOTE

The book study guide was developed by the *Catalyzing Change in Middle School Mathematics* writing team: Sarah B. Bush, Christa Jackson, Eric Milou, and George J. Roy.

LEARN MORE

Find more resources at www.nctm.org/change for the Catalyzing Change series (Early Childhood and Elementary, Middle School, and High School), including information on ordering copies of the books.

ABOUT NCTM

The National Council of Teachers of Mathematics is the world's largest mathematics education organization. NCTM advocates for high-quality mathematics teaching and learning for each and every student. *Catalyzing Change in Middle School Mathematics* is an official position of the National Council of Teachers of Mathematics (NCTM), as approved by the NCTM Board of Directors, October 2019.

Chapter 1

Why We Need to Catalyze Change

After reading chapter 1, engage in critical conversations centered on the following questions.

1. What are some ways in which the teaching and learning of mathematics in our setting have changed over time? How might these changes be beneficial to students, both currently and for their future? What changes still need to be made in our setting?

2. What does our ideal middle school mathematics classroom and school structure look like? What are some steps we can take toward making this vision a reality?

3. In what ways can we ensure that students in our setting are engaged in rich investigations that reinstate mathematics to its rightful position as a magnet to STEM?

4. What are our initial reactions to each of the four key recommendations? What strengths do we bring to making each of these recommendations a reality in our setting? What obstacles will we need to address and overcome?

5. How will we invite stakeholders into both the conversation and enactment of our steps to catalyzing change?

Ideas and Key Takeaways from this Book Study Session:

Chapter 2

The Purposes of Middle School Mathematics

> **Key Recommendation:** Each and every student should develop deep mathematical understanding, understand and critique the world through mathematics, and experience the wonder, joy, and beauty of mathematics, which all contribute to a positive mathematical identity.

After reading chapter 2, engage in critical conversations centered on the following questions.

1. How might specific system structures, policies, and practices we currently have in place undermine teaching for deep mathematical understanding? What steps might we take to eliminate these obstacles?

2. How can all the stakeholders in our community collaborate to position deep mathematical understanding as a foundational purpose of our school mathematics program?

3. How can we better leverage students' unique backgrounds, experiences, cultural perspectives, traditions, and knowledge as strengths to deepen student mathematical understanding?

4. In what ways are we currently providing opportunities for students to understand and critique the world through mathematics? Where are we missing opportunities that we should embrace for students to understand and critique the world through mathematics?

5. In what ways can we integrate the wonder, joy, and beauty of mathematics into students' daily mathematical learning experiences?

6. In what short- and long-term initiatives must we engage to achieve the multiple purposes of mathematics?

Ideas and Key Takeaways from this Book Study Session:

Chapter 3

Creating Equitable Structures

> **Key Recommendation:** Middle school mathematics should dismantle inequitable structures, including tracking teachers as well as the practice of ability grouping and tracking students into qualitatively different courses.

After reading chapter 3, engage in critical conversations centered on the following questions.

1. How have our perceptions about what students can and cannot do mathematically influenced our past actions, decisions, and ultimately the way we have structured our mathematics program?

2. What first steps can we take to identify biases in our setting? What can we do to eliminate the biases?

3. What strengths do our students bring that we are currently not leveraging to help them be successful mathematically? What steps can we take to better leverage these strengths?

4. What are our current policies and practices regarding ability grouping and tracking? What should our action steps be to dismantle these policies and practices?

5. What steps can we take to de-track teacher assignments, and how will this support more equitable structures and a shared responsibility for the success of all students?

6. How will we address pushbacks and barriers we face as we begin to dismantle tracking, and how will we engage stakeholders in conversations to better understand why we are dismantling such structures?

7. What mathematical instructional supports are currently in place to support students in our setting? In what ways might these supports be privileging or marginalizing some students?

Ideas and Key Takeaways from this Book Study Session:

Chapter 4

Implementing Equitable Mathematics Instruction

> **Key Recommendation:** Mathematics instruction should be consistent with research-informed and equitable teaching practices that foster students' positive mathematical identities and strong sense of agency.

After reading chapter 4, engage in critical conversations centered on the following questions.

1. In our setting, how can teachers be collectively supported to build classroom cultures in which students develop a positive mathematical identity and strong sense of mathematical agency?

2. How can we collaborate with families and communities to support students' positive mathematical identities and strong sense of mathematical agency?

3. To what degree are we currently embodying equitable mathematics teaching practices? What supports are needed in our setting for teachers to be empowered to prioritize and fully embody equitable mathematics teaching practices in their classrooms and throughout the broader school culture?

4. What suggestions do we have to better structure the quantity and quality of our mathematics-focused collaborative time?

5. What partnerships do we need to form and foster to best support the implementation of equitable mathematics instruction?

Ideas and Key Takeaways from this Book Study Session:

Chapter 5

Developing Deep Mathematics Understanding

> **Key Recommendation:** Middle schools should offer a common shared pathway grounded in the use of mathematical practices and processes to coherently develop deep mathematical understanding, ensuring the highest-quality mathematics education for each and every student.

After reading chapter 5, engage in critical conversations centered on the following questions.

1. To what extent do we prioritize the mathematical practices and processes in our setting? To what extent is all of our instruction grounded in the mathematical practices and processes?

2. What supports do teachers in our setting need to ensure students' development of the mathematical practices and processes in their daily mathematics instruction?

3. To what extent are mathematical and statistical modeling, appropriate use of technology, and mathematical reasoning interwoven throughout the five middle school mathematics content domains?

4. How can we provide students with more consistent and meaningful experiences with modeling, reasoning, and technology?

5. What are some ways teachers in our setting can be best supported with specific mathematics content development needs to ensure each and every student has a coherent mathematical learning experience?

Ideas and Key Takeaways from this Book Study Session:

Chapter 6

Next Steps for Catalyzing Change

Congratulations. It's now time to consider next steps! After reading chapter 6, engage in critical conversations centered on the following questions.

1. Review the action steps for our role. What are some steps we can take immediately, in the short-term, and in the long-term to enact the recommendations in *Catalyzing Change in Middle School Mathematics*?

2. What steps will we take to enlist other stakeholders in efforts to initiate, engage in critical conversations, and collectively take action toward *Catalyzing Change in Middle School Mathematics*?

3. How will our action plan be organized around the four key recommendations? How will we operationalize this work?

4. How can we ensure this work remains collaborative, transparent, and inclusive across stakeholders?

5. What is your biggest takeaway from the *Catalyzing Change* book study? How has this had an impact on you personally?

Ideas and Key Takeaways from this Book Study Session: