

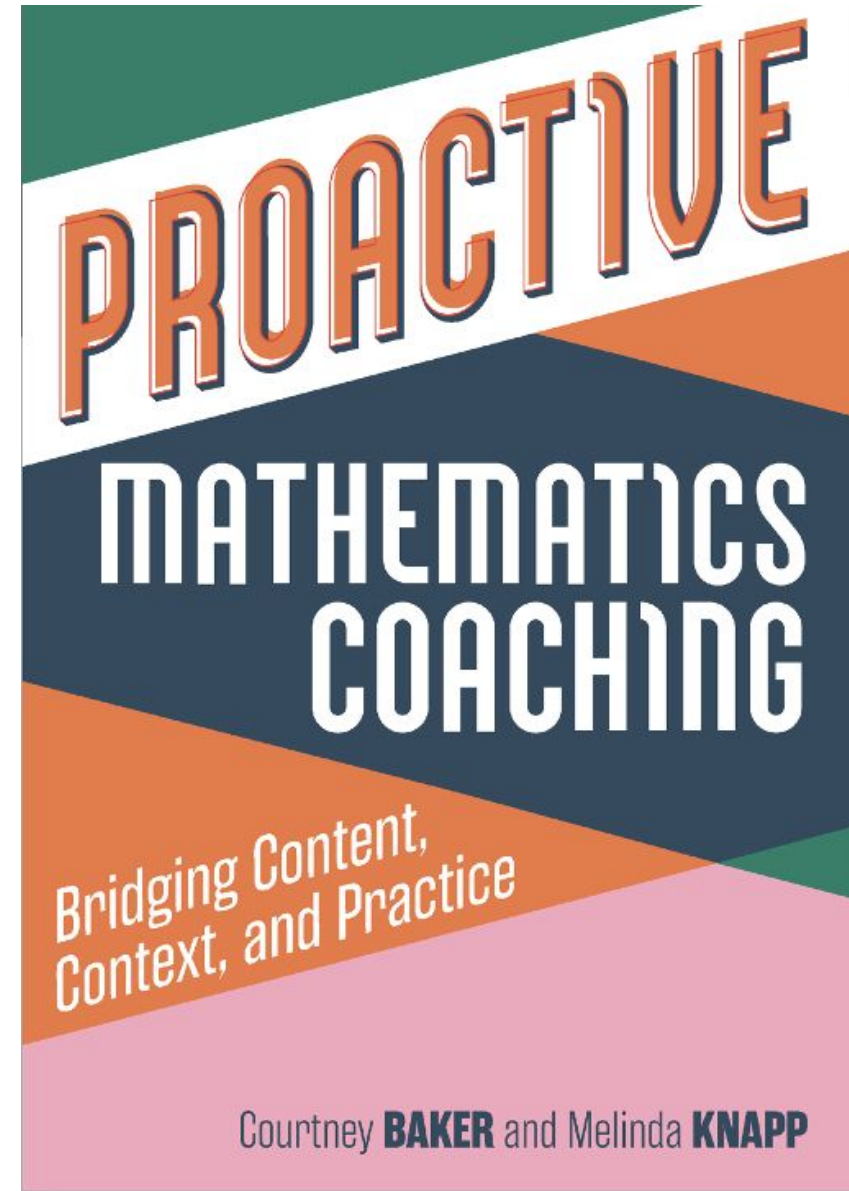
# WELCOME!

## NCTM Book Study

### Catalyzing Change Through Proactive Mathematics Coaching

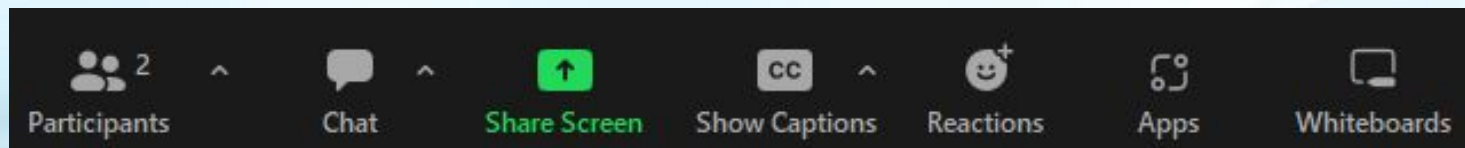
Melinda Knapp, PhD

Courtney Baker, PhD



# Welcome!

- **Please keep your microphone muted!**
- **Chat box:** Comment, chat with other participants, and ask questions.
- **Video:** Be mindful that everyone can see your video unless you choose to stop sharing.
- **Show Captions:** Use to hide or view subtitles.



# Welcome!

- A recording will be available to registered attendees for 30 days after the session.
- We will provide a certificate of participation within a few days of the session.
- Follow us on Twitter @NCTM and share your thoughts about today's session using the hashtag #NCTMPD.

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# Catalyzing Change Through Proactive Mathematics Coaching

## Today's Agenda

Part I: Welcome

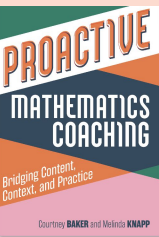
Part II: Connecting to *Catalyzing Change*

Part III: The Case of Laila

# Part I: Welcome & Overview



**NCTM Book Study: Catalyzing Change Through Proactive Mathematics Coaching**  
Melinda Knapp & Courtney Baker



# Introductions

## Mathematics Coaches At Heart

**Melinda Knapp, PhD**



[melinda.knapp@osucascades.edu](mailto:melinda.knapp@osucascades.edu)

**Courtney Baker, PhD**



[cbaker@gmu.edu](mailto:cbaker@gmu.edu)

# Our Book Study Goals

## Connecting Research & Practice

- Gain insights into what it takes to plan professional learning and/or coaching interactions that advance leadership agendas for long- and short-term goals.
- Illuminate how the use of the Proactive Coaching Framework (PCF) can advance the vision of teaching and learning mathematics advocated for within the Catalyzing Change series.



# Our Book Study Goals

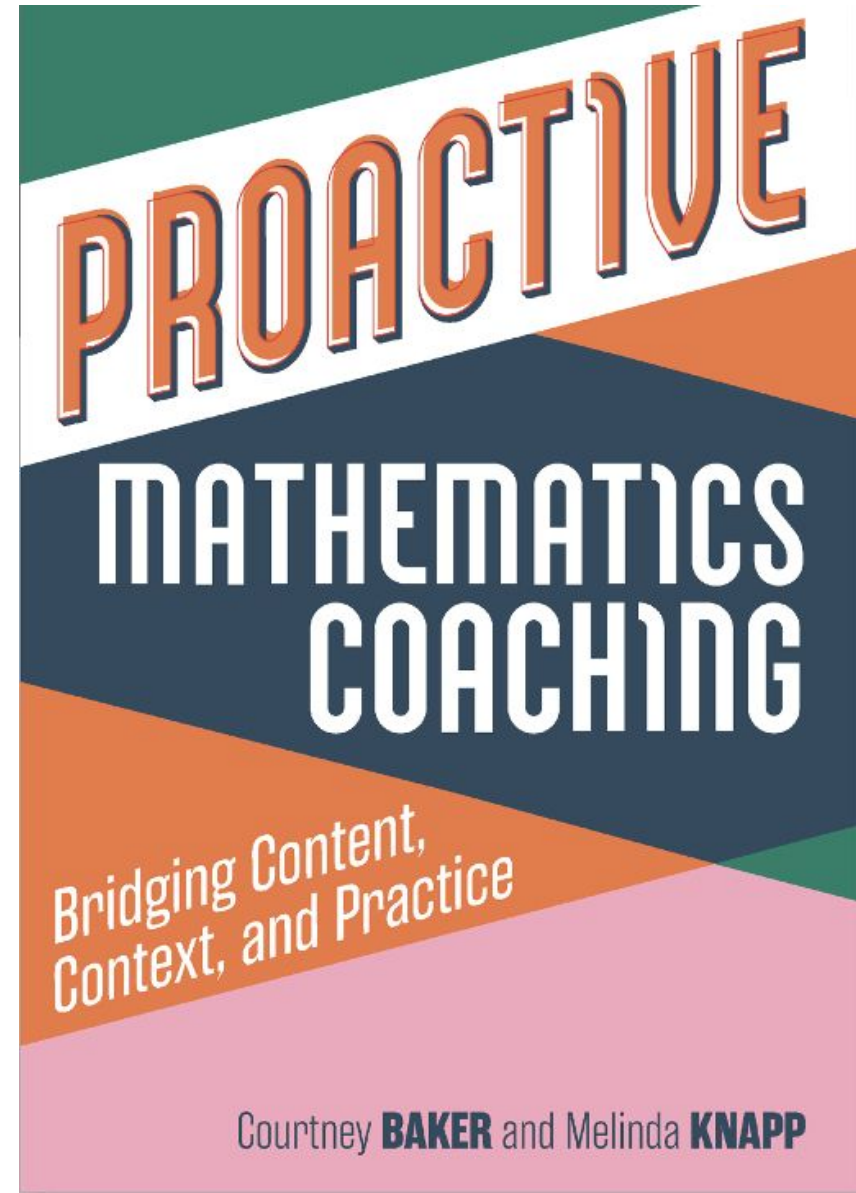
## Connecting Research & Practice

- Engage with activities presented in the book such as Calling In/Calling Out (p. 63), and Perspective Taking (p. 183) to consider how these activities could be useful within your coaching context.
- Participate in discussions (network and collaborate) with peers to share common problems of practice and engage in debriefs that will inform goal setting within your context.

# Book Orientation

## A Brief Overview

Grab your  
book!



# Creating Alliances

## Building Your Network

 Please Share on Our  
Google Sheet

- Name
- Position
- School(s)
- Coaching/Leadership Experience
- Email address



# Maximize Your Experience

Engage in Multiple Formats

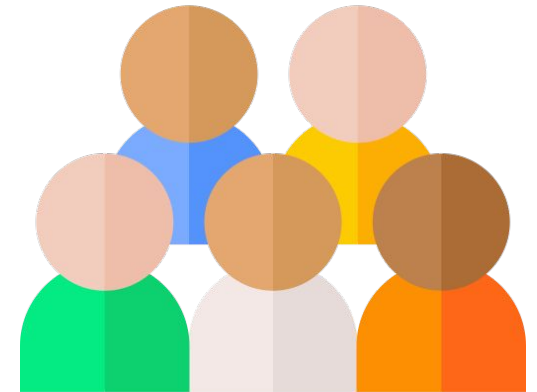
Chat Box



Jamboards



Breakout Rooms



# Understanding Our Influence

Questions At The Core of Our Practice

Is what I am doing  
actually effective? And  
who is it effective for?

# Mathematics Leadership

Many Part- & Full-Time Positions

Check  
Out the  
Preface!  
(page v)

## Some Possibilities

- Classroom Teacher
- Math Lead
- Department Chair
- Interventionist
- Mathematics Specialist
- Instructional Coach
- District Supervisor

# Understanding Our Influence

## Developing A Proactive Practice



“Research indicates that **leadership for teaching and learning** has a direct impact on student learning. Leadership is widely recognized as one of **the most important factors** in teacher and student learning.”

(Loucks-Horsley, 2010, p. 5)



# Maximize Your Experience

## Workshop Norms to (Re)Frame Leadership

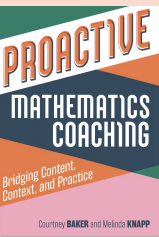
- Assume Positive Intent
- Learn From & With Each Other
- Maintain An Asset-Based Approach
- Value Others' Experiences
- We Teach All Students & Lead/Coach All Stakeholders
- Other?



# Part II: Connecting to *Catalyzing Change*



**NCTM Book Study: Catalyzing Change Through Proactive Mathematics Coaching**  
Melinda Knapp & Courtney Baker



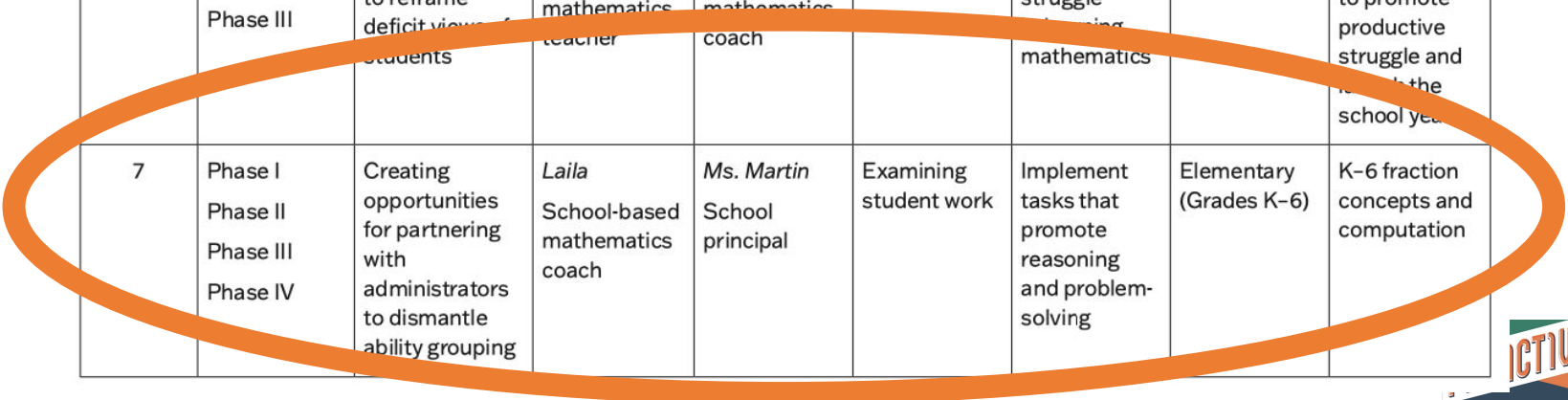
# Chapter 7: The Case of Laila

Chapter 7  
Pages 75-91

## The Case

The **Case of Laila** explores how a school-based mathematics coach is working towards changing the prevalent use of computer programs and ability grouping to ensure rich and relevant mathematics for all students.

| Case Summary |  |   | People   |  | Practices                     |  | Context In Brief           |   |
|--------------|--|---|--|--|-------------------------------|--|----------------------------|---|
| Chapter      | PCF Phases Emphasized                        | Big Idea  | Mathematics Leader and Role  | Involved School Stakeholders                       | Mathematics Coaching Practice | Mathematics Teaching Practice                              | Grade-Level and Grade Band | Content Topic   |
| 5            | Phase II<br>Phase III                        | Balancing two roles while implementing a modified coaching cycle                        | <i>Michelle</i><br>Part-time Grade 8 classroom teacher; part-time school-based mathematics coach | <i>Mrs. Lee</i><br>Grade 8 teacher                 | Coteaching                    | Facilitate meaningful mathematical discourse               | Middle school (Grade 8)    | Counting cubes task; linear growth model  |
| 6            | Phase I<br>Phase II<br>Phase III             | A high school teacher working to reframe deficit views of students                      | <i>Kamala</i><br>High school mathematics teacher   | <i>Mr. Singh</i><br>School-based mathematics coach | Modeling instruction          | Support productive struggle in mathematics                 | High school (Grades 9–12)  | A mathematics task to promote productive struggle and learning in the school year |
| 7            | Phase I<br>Phase II<br>Phase III<br>Phase IV | Creating opportunities for partnering with administrators to dismantle ability grouping | <i>Laila</i><br>School-based mathematics coach   | <i>Ms. Martin</i><br>School principal              | Examining student work        | Implement tasks that promote reasoning and problem-solving | Elementary (Grades K–6)    | K–6 fraction concepts and computation   |



# Introducing the Case of Laila

## Case Essentials

### Using the PCF to Catalyze Change

The Case of Laila highlights how a school-based mathematics coach takes action to decrease a school's reliance on using computerized programs to support student learning while supporting the increased use of rich problem-solving tasks. At Laila's school, teachers often group students based on the previous year's standardized test scores and, once created, many of these groups are stagnant and homogeneous. In response, students are assigned to computerized programs to "meet their individual needs" and are mainly provided with instruction that focuses on memorization and procedural fluency. Laila uses the PCF to prepare for an upcoming meeting with the newly hired principal to discuss the prevalent use of computer programs while advocating for rich and relevant mathematics instruction for all.

“We are challenged that children’s mathematics experiences are of **uneven quality** at every level. **Disparities exist** within individual classrooms, across grade levels within schools, and across schools within districts. The **evidence is compelling** that children who are identified as Black, Latinx, Indigenous, language learners, poor, and with disabilities, along with other **marginalized learners, do not have the same opportunities** as their peers to access and learn in mathematically powerful spaces.”

(NCTM, 2020, p. 1)

# Catalyzing Change (NCTM, 2018, 2020a, 2020b)

## Key Recommendations

|   | <b>Early Childhood and Elementary</b><br>(NCTM, 2020a)  | <b>Middle School</b><br>(NCTM, 2020b)  | <b>High School</b><br>(NCTM, 2018)  |
|---|---|--|---|
| <b>Creating Equitable Structures in Mathematics</b> | Early childhood and elementary mathematics should dismantle inequitable structures, including ability grouping and tracking, and challenge spaces of marginality and privilege. | 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. | High school mathematics should discontinue the practice of tracking teachers as well as the practice of tracking students into qualitatively different or dead-end course pathways. |

# **Catalyzing Change** (NCTM, 2018, 2020a, 2020b)

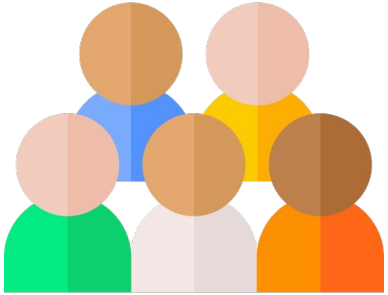
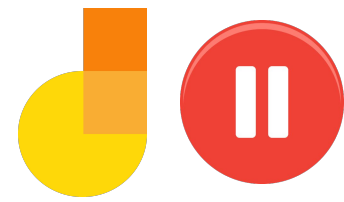
## **Creating Equitable Structures In Math**

“Mathematics teaching and learning is complex and embedded in a broader societal context of inequities in which implicit and explicit biases are pervasive (NAEYC, 2019). Ensuring that each and every child has access to just, equitable, and inclusive mathematics learning opportunities demands change in institutional structures, teaching and learning environments, and individual beliefs and actions.”

(NCTM, 2020b, p. 25)

# Using the PCF to Catalyze Change

## Breakout Session



### Breakout Rooms

Reflect on and discuss the question(s) below. Use the Jamboard to record your groups' ideas. (slides 1-7)

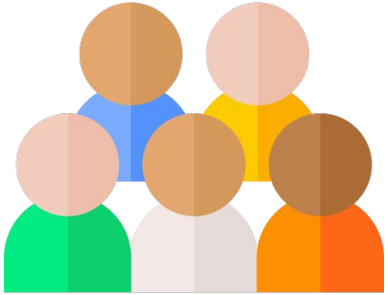
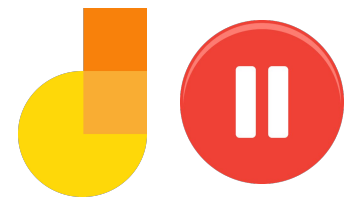
**Q1:** In what ways are students grouped for mathematics instruction, either within classrooms or across classrooms? What are school or district policies about acceleration and/or grouping students for mathematics instruction?

(adapted from NCTM, 2020a; 2020b)



# Using the PCF to Catalyze Change

## Breakout Session



### Breakout Rooms

Reflect on and discuss the question(s) below. Use the Jamboard to record your groups' ideas. Slides 8-15

**Q2:** What are the support structures needed in our district to dismantle tracking and/or inequitable grouping? What pushbacks might you anticipate and consider as you begin to dismantle tracking and/or inequitable grouping?

(NCTM, 2020b, p. 36)

# Connecting to *Catalyzing Change*

## Group Discussion

What ideas did  
you have?

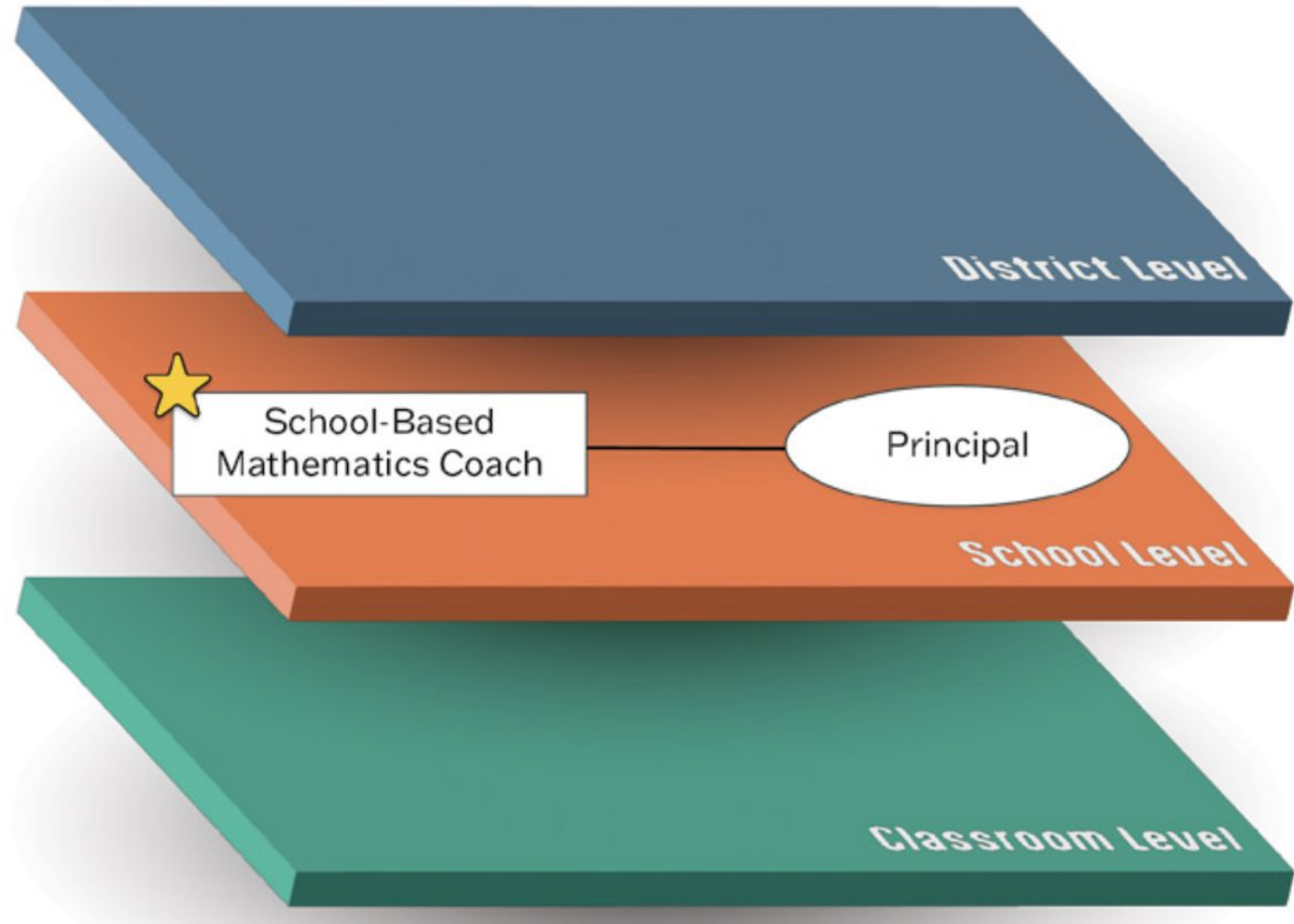
What ideas did  
you hear?



# Part III: Exploring the Case of Laila

# Introducing the Case of Laila

## Case Essentials



# Introducing the Case of Laila

## Case Essentials

### Laila's Problem of Practice

Last year's standardized test scores are being used to place students in groups on computerized programs to "meet their individual needs." Laila, a school-based mathematics coach, has observed that students who have tested "below standard" tend to be provided instruction that narrowly focuses on memorization and procedural fluency. How can Laila impact the school's overreliance on using computerized programs to meet students' math learning needs and broaden students' opportunities to learn math?

# Introducing the Case of Laila

## Case Essentials

Examining student work for a principal's professional learning in a 1-on-1 meeting for the purpose of halting ability groups to implement tasks that promote reasoning and problem-solving with students.

|                         |  |
|-------------------------|--|
| <b>Long-Term Goal</b>   | Detrack K–6 mathematics at Liberty Elementary School by removing fixed-ability grouping structures.  |
| <b>Short-Term Goals</b> | <ul style="list-style-type: none"><li>• Initiate a conversation with the new principal that highlights the limitations of grouping students who end up sitting behind a computer screen.</li><li>• Understand the power of examining student work samples of math tasks in teacher decision-making (so teachers understand the value in learning through problem-solving).</li></ul> |

# Introducing the Case of Laila

## Case Essentials

### **Phase I** **Assess the Coaching Situation**

Understand the Coaching Role & Define the Mathematics Content Focus

### **Phase II** **Establish a Coaching Goal**

Synthesize Situational Knowledge & Envision Changes in Teaching and Learning

### **Phase III** **Connect Coaching Goals to Teacher Practice**

Select Mathematics Coaching & Teaching Practices

### **Phase IV** **Reflect on Enactment**

Evaluate Progress Towards Coaching Goal & Debrief and Continue the Journey

# Introducing the Case of Laila

## Case Essentials

### Mathematics Coaching

#### Practices

(adapted from Baker & Knapp, 2019; Gibbons & Cobb, 2017; TDG, 2010)

- Engage in Mathematics
- Examine Student Work
- Analyze Classroom Video
- Rehearse Aspects of Practice
- Engage in Lesson Study/Studio Day/Math Labs
- Co-teach
- Model Instruction

### Mathematics Teaching Practices (NCTM, 2014)

- Establish mathematics goal
- Implement tasks that promote reasoning and problem solving
- Use and connect mathematics representations
- Facilitate meaningful mathematical discourse
- Pose purposeful questions
- Build procedural fluency from conceptual understanding
- Support productive struggle
- Elicit and use evidence of student thinking



# Long- vs. Short-Term Goals

## Why Set Coaching Goals?

- Clearly articulated and explicit goals are the foundation of learning (Hiebert et al., 2007)
- Reasonable and realistic goals can motivate learning (Marzano, 2003; McTighe & Wiggins, 2013)
- Goals guide self-assessment (Clarke et al., 2004; Zimmerman, 2001)



# Long- vs. Short-Term Goals

## Why Set Coaching Goals?

- Maintain a consistent vision
- Build capacity across stakeholders
- Focus on improvement of research-based instructional practice
- Monitor progress toward overall learning outcomes.
- Identify evidence that highlights the effectiveness and provides insight for possible next steps.

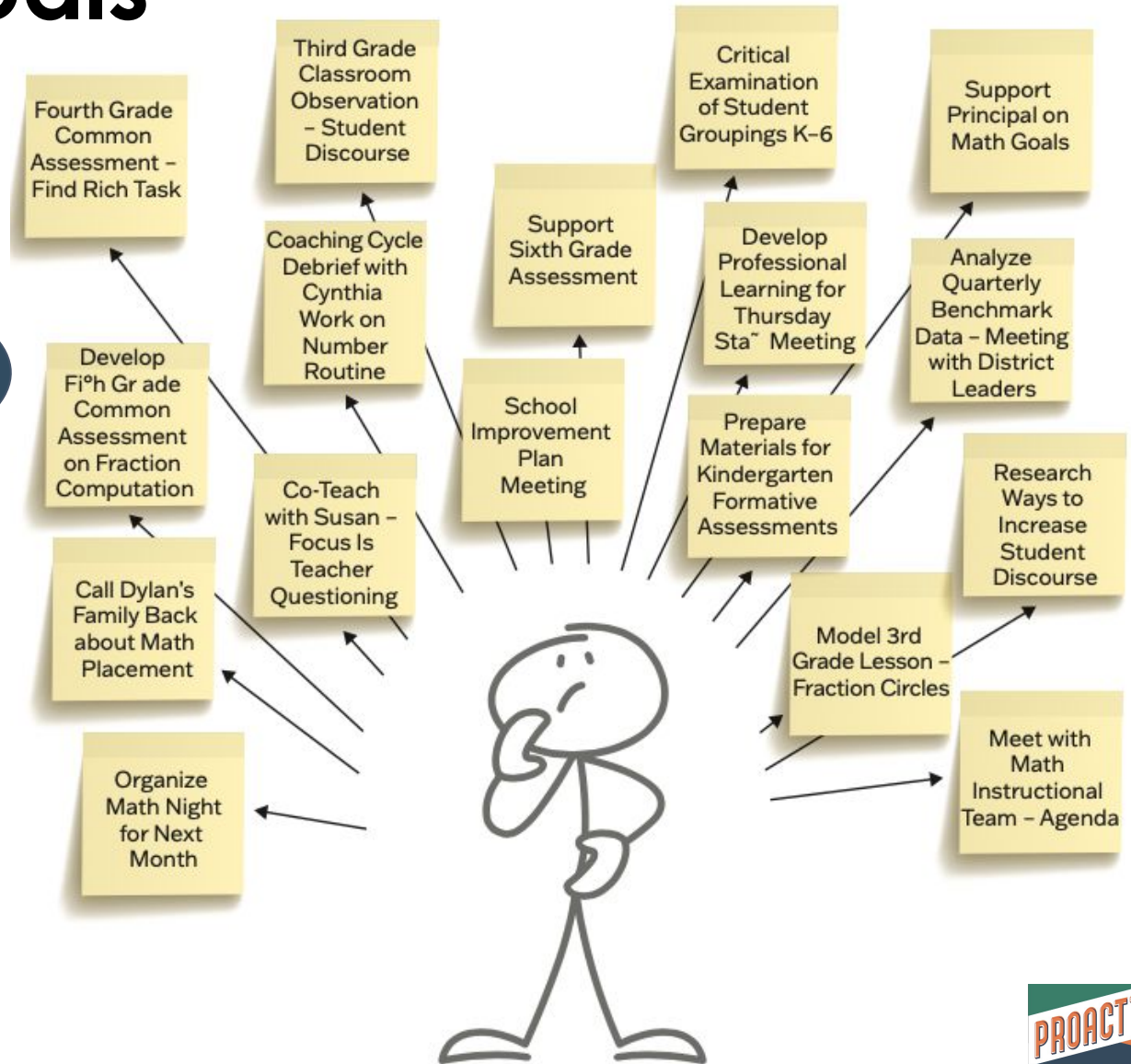


# Long- vs. Short-Term Goals

## Why Set Coaching Goals?

Check Out  
Page 37

Reactive



# Long- vs. Short-Term Goals

## Why Set Coaching Goals?

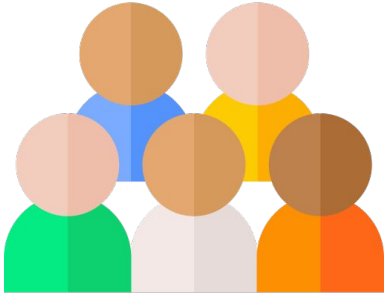
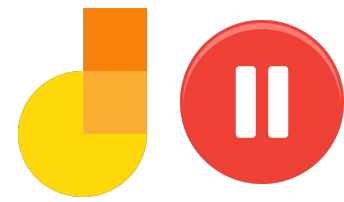
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Page 37

Proactive



# Using the PCF to Catalyze Change

## Breakout Session



### Breakout Rooms

Reflect on and discuss the question(s) below. Use the Jamboard to record your groups' ideas.

**Q3:** Reflect on Laila's next steps. If you were the mathematics coach in this scenario what would you do next? Why? What short-term goals might you create?

(adapted from Baker & Knapp, 2023, p.91)

# Developing the PCF

## Connecting to *Catalyzing Change* (NCTM, 2020)

An actionable step includes providing “teachers, coaches, and specialists with professional development opportunities, both in and out of the school setting, to critically examine, learn, and reflect on mathematics content, pedagogy, beliefs and biases.” (p. 126).

# Next Time [4/18]

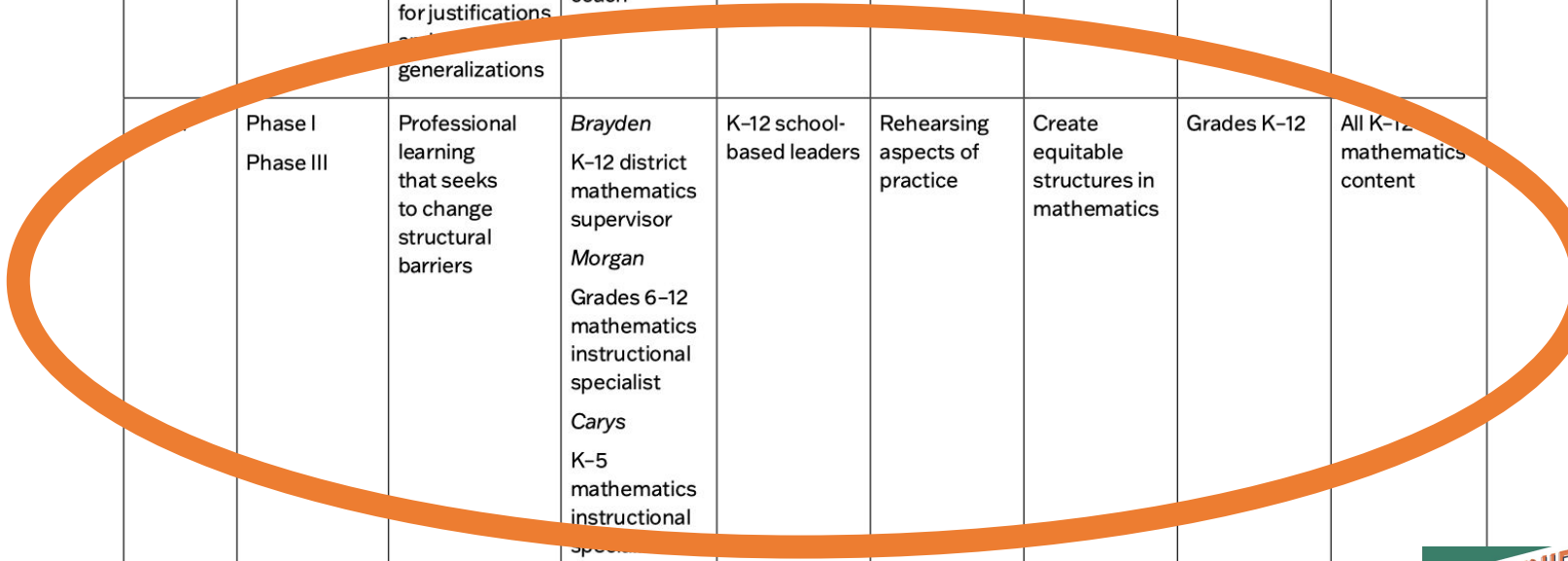
## Rehearsing Aspects of Practice Chapter 11

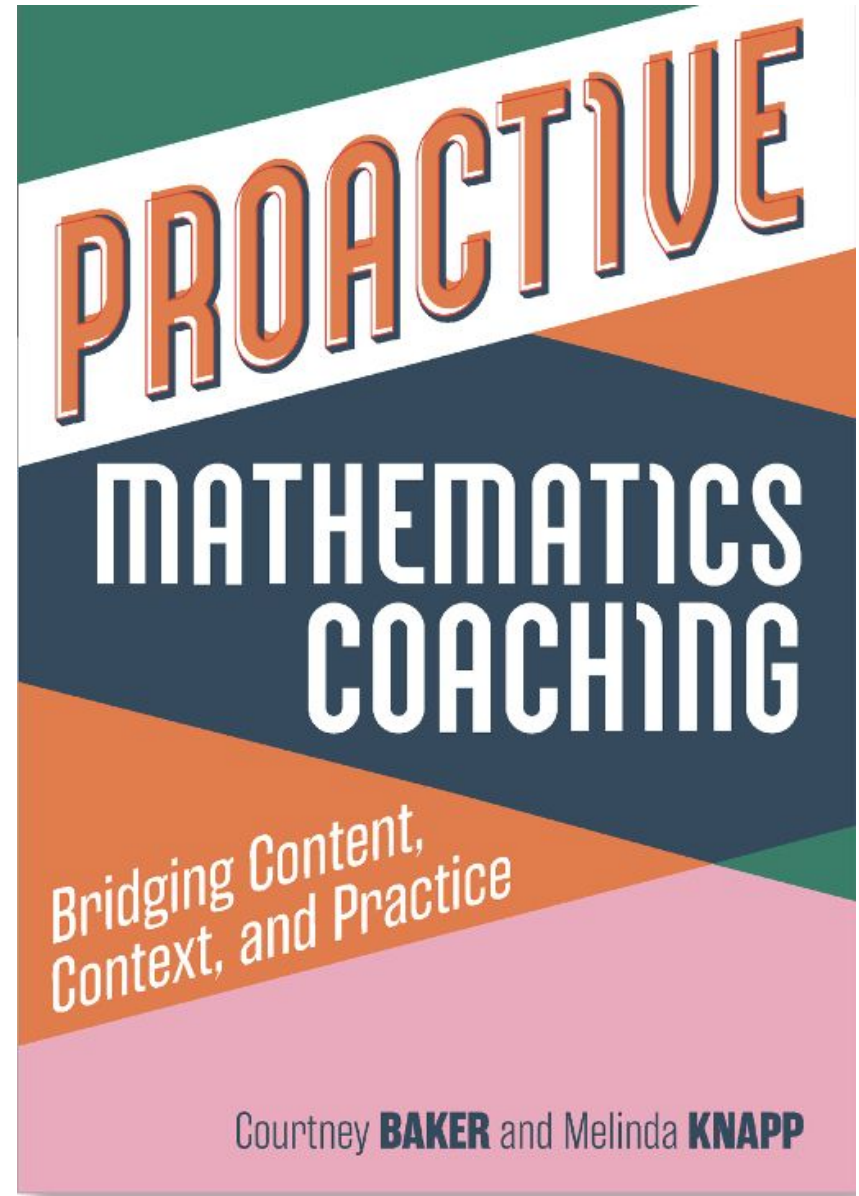
Check Out  
Chapter 11  
Pages  
167-192

### The Case

In this case you will meet **Brayden, Morgan and Carys** working to both analyze district pacing guides for embedded inequities and examine how they might be limiting students' success in math.

| Case Summary |                       |  | People  |   | Practices                      |  | Context In Brief           |                              |
|--------------|-----------------------|--|---|---|--------------------------------|--|----------------------------|------------------------------|
| Chapter      | PCF Phases Emphasized | Big Idea   | Mathematics Leader and Role   | Involved School Stakeholders                      | Mathematics Coaching Practice  | Mathematics Teaching Practice              | Grade-Level and Grade Band | Content Topic                |
| 10           | Phase III             | Use of a video club to support teachers to learn to press for justifications and generalizations | <i>Karina</i><br>K-8 school-based STEM coach  | Video club for middle school mathematics teachers | Analyzing video                | Pose purposeful questions                  | Middle school (Grades 6-8) | The hexagon pattern task     |
|              | Phase I<br>Phase III  | Professional learning that seeks to change structural barriers                                   | <i>Brayden</i><br>K-12 district mathematics supervisor<br><i>Morgan</i><br>Grades 6-12 mathematics instructional specialist<br><i>Carys</i><br>K-5 mathematics instructional specialist | K-12 school-based leaders                         | Rehearsing aspects of practice | Create equitable structures in mathematics | Grades K-12                | All K-12 mathematics content |



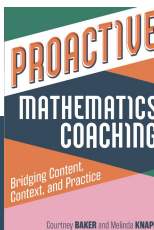


Next  
Time

Chapter 11  
April 18th




NCTM Book Study: Catalyzing Change Through Proactive Mathematics Coaching  
Melinda Knapp & Courtney Baker





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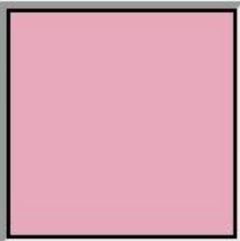
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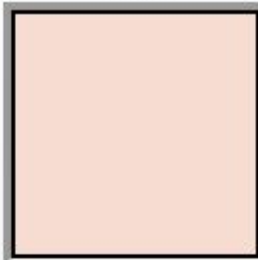
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# Maximize Your Experience

## Workshop Norms to (Re)Frame Leadership

- Assume Positive Intent
- Learn From & With Each Other
- Maintain An Asset-Based Approach
- Value Others' Experiences
- We Teach All Students & Lead/Coach All Stakeholders
- Other?



# Connecting to *Catalyzing Change*

## Group Discussion

What ideas did  
you have?

What ideas did  
you hear?



# Book Orientation

## Chapters 5-11

Check Out  
Pages  
197-199

### The 9 Cases

- Part-Time Leaders
- Leaders at Multiple Schools
- District Leaders
- Classroom Teachers
- Department Chair
- STEM Coach
- ...

| Case Summary |  |   | People   |  | Practices                     |  | Context In Brief           |  |
|--------------|--|---|--|--|-------------------------------|--|----------------------------|--|
| Chapter      | PCF Phases Emphasized                        | Big Idea  | Mathematics Leader and Role  | Involved School Stakeholders                       | Mathematics Coaching Practice | Mathematics Teaching Practice                              | Grade-Level and Grade Band | Content Topic  |
| 5            | Phase II<br>Phase III                        | Balancing two roles while implementing a modified coaching cycle                        | <i>Michelle</i><br>Part-time Grade 8 classroom teacher; part-time school-based mathematics coach | <i>Mrs. Lee</i><br>Grade 8 teacher                 | Coteaching                    | Facilitate meaningful mathematical discourse               | Middle school (Grade 8)    | Counting cubes task; linear growth model                                     |
| 6            | Phase I<br>Phase II<br>Phase III             | A high school teacher working to reframe deficit views of students                      | <i>Kamala</i><br>High school mathematics teacher   | <i>Mr. Singh</i><br>School-based mathematics coach | Modeling instruction          | Support productive struggle in learning mathematics        | High school (Grades 9–12)  | A mathematics task to promote productive struggle and launch the school year |
| 7            | Phase I<br>Phase II<br>Phase III<br>Phase IV | Creating opportunities for partnering with administrators to dismantle ability grouping | <i>Laila</i><br>School-based mathematics coach   | <i>Ms. Martin</i><br>School principal              | Examining student work        | Implement tasks that promote reasoning and problem-solving | Elementary (Grades K–6)    | K–6 fraction concepts and computation  |

# Book Orientation

## Chapters 5-11

### The Book Centered On Cases

Provides opportunities to learn about each of the Mathematics Coaching Practices and see how a mathematics leader uses the **Proactive Coaching Framework**

### Our Book Study Centered On Coaching Practices

Affords opportunity to delve immediately and deeply into the **Mathematics Coaching Practices**

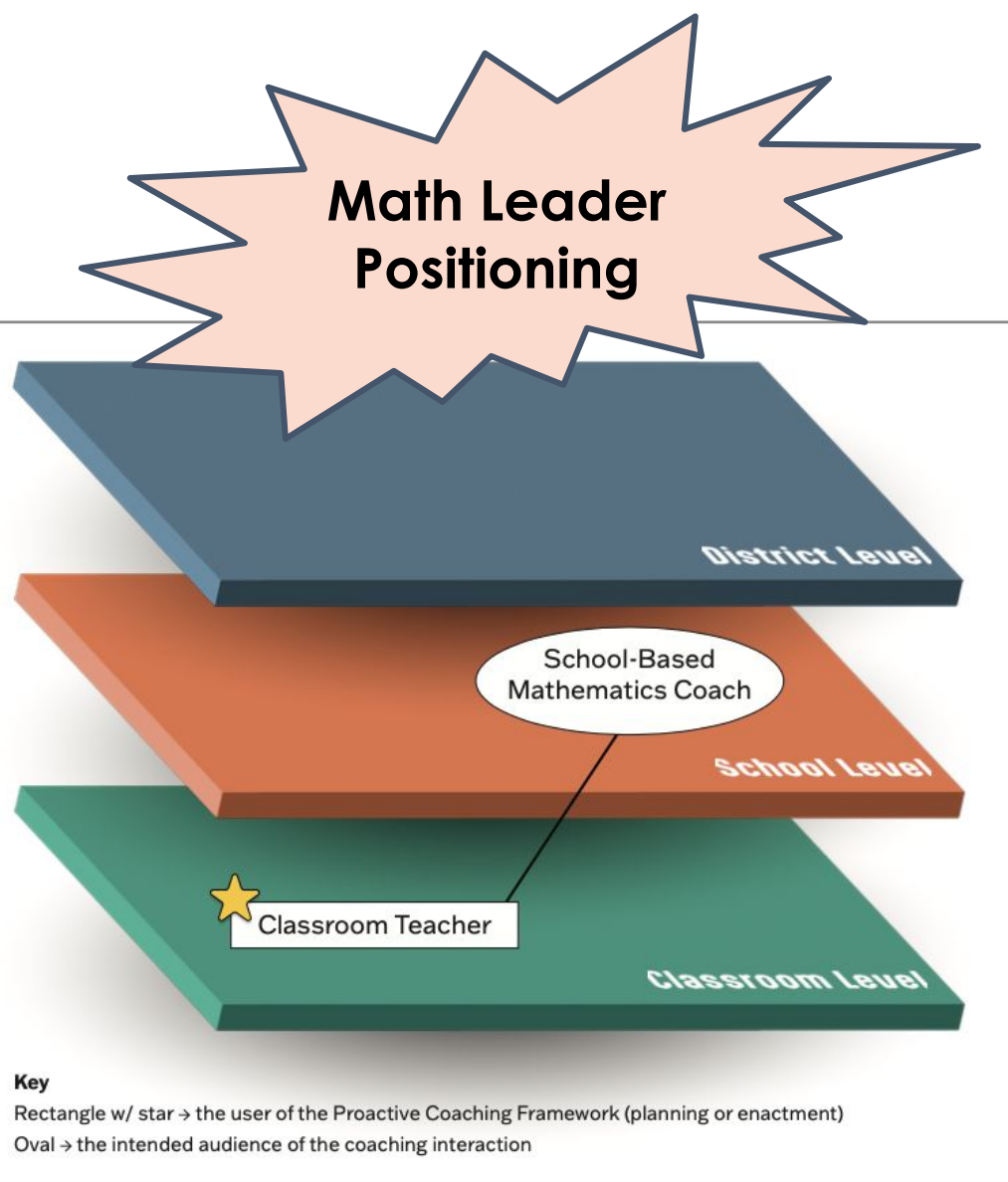
# Book Orientation

## Case Elements

### Long- & Short-Term Goals

Coteaching for a classroom teacher's professional learning in an after-school meeting for the purpose of increasing student-to-student dialogue connected to facilitating meaningful mathematical discourse

|                        |  |
|------------------------|--|
| <b>Long-Term Goal</b>  | Increase student discourse within all mathematics classrooms.      |
| <b>Short-Term Goal</b> | Implement, through coteaching, talk moves in Mrs. Lee's classroom. |



# Book Orientation

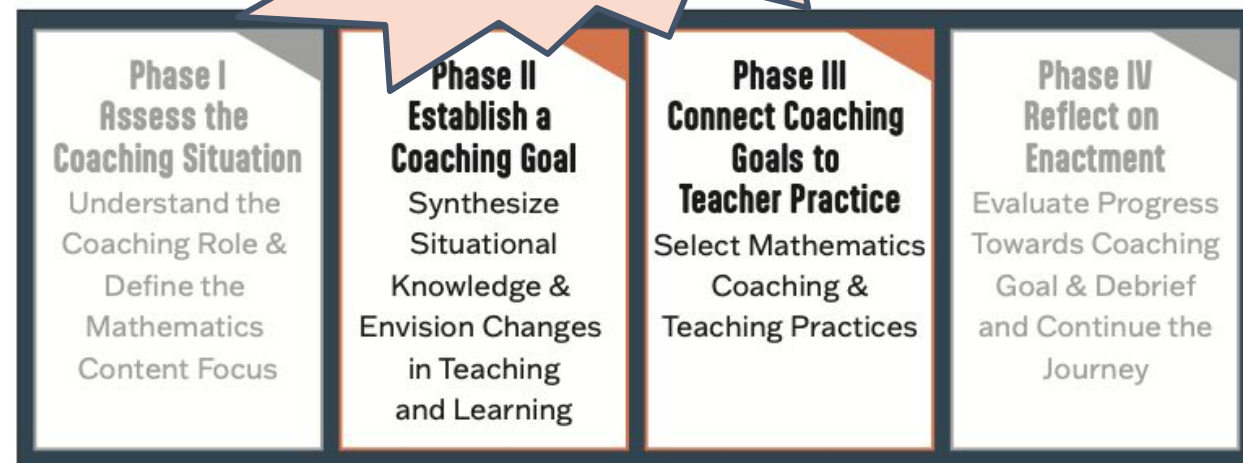
## Case Elements

### Connections to Catalyzing Change

#### Connections to Catalyzing Change

The case of Michelle highlights a part-time mathematics teacher and part-time mathematics coach who has regularly used coaching cycles to support equity-focused instructional shifts in her school. When mathematics classrooms are not student-centered and inclusive, they fail to support high-quality, deep mathematical learning experiences for all students that can impact the development of a positive mathematical identity. Michelle uses the PCF to make a plan that honors the goal her colleague has identified to increase student-to-student discourse knowing that this has the potential to foster students' positive mathematical identities.

### Enacted Phases



# Book Orientation

## Case Elements

### The Problem of Practice

#### Michelle's Problem of Practice

Mrs. Lee, a Grade 8 mathematics teacher, has asked to coteach a mathematics lesson so that she can increase student discourse in her classroom. Although excited for this opportunity, Michelle, a part-time mathematics coach and part-time classroom teacher, is wary of the short timeline because there is not enough time to do a full coaching cycle with in-depth planning beforehand. How can Michelle engage in a modified coaching cycle that honors the process of the coaching cycle, meets the realistic time constraints of this situation, and moves past the barriers to implementation?

### Planning

#### Planning Guide: Phase III

##### Context

*Select Mathematics Coaching Practice*

##### How will you negotiate and justify the choice of one or more MCPs?

Mrs. Lee requested that we coteach together, but we have a limited amount of time to prep together. She can meet for 15 minutes after school and the rest of our coordination and planning can be through email.

##### Which MCP best aligns with your coaching situation and your coaching goals?

Coteaching, because it was requested by the teacher, but I'm not sure which model we will use during the lesson.

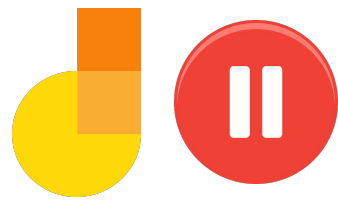
**Michelle:** I think I have found a way to honor many of the aspects of the coaching cycle, while trying to honor both Mrs. Lee's learning as well as her time. I am hoping that Mrs. Lee will appreciate the efforts that I have put into planning for our meeting so that we can be focused on tasks like taking the time to research and draft out some ideas for each of the tasks and considering ways she can be involved in either observing or supporting the lesson. I hope she feels that this is beneficial to her and that we can move forward from there. We might end up with a short lesson or even trying this a few more times to see what works. The work that results might be data I could collect in the future to see if Mrs. Lee is ready to continue or if she needs more support. I am going to look for in terms of her ability to implement a particular model.

### Perspective

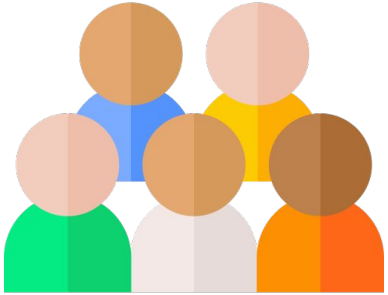


# Using the PCF to Catalyze Change

## Breakout Session



### Breakout Rooms



Reflect on and discuss the question(s) below. Use the Jamboard to record your groups' ideas.

**What obstacles or barriers do you face when trying to catalyze change in your community?**

- What actions have you taken?
- What results have you experienced/observed?

# Using the PCF to Catalyze Change

## Group Discussion

What ideas did  
you have?

What ideas did  
you hear?

