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KENTUCKY CENTER
FOR MATHEMATICS

KCM Favorites

Routines for Reasoning:

Fostering the Mathematical Practices in All Students

Grace Kelemanik/Amy Lucenta/Susan Creighton

Welcome!

Your host

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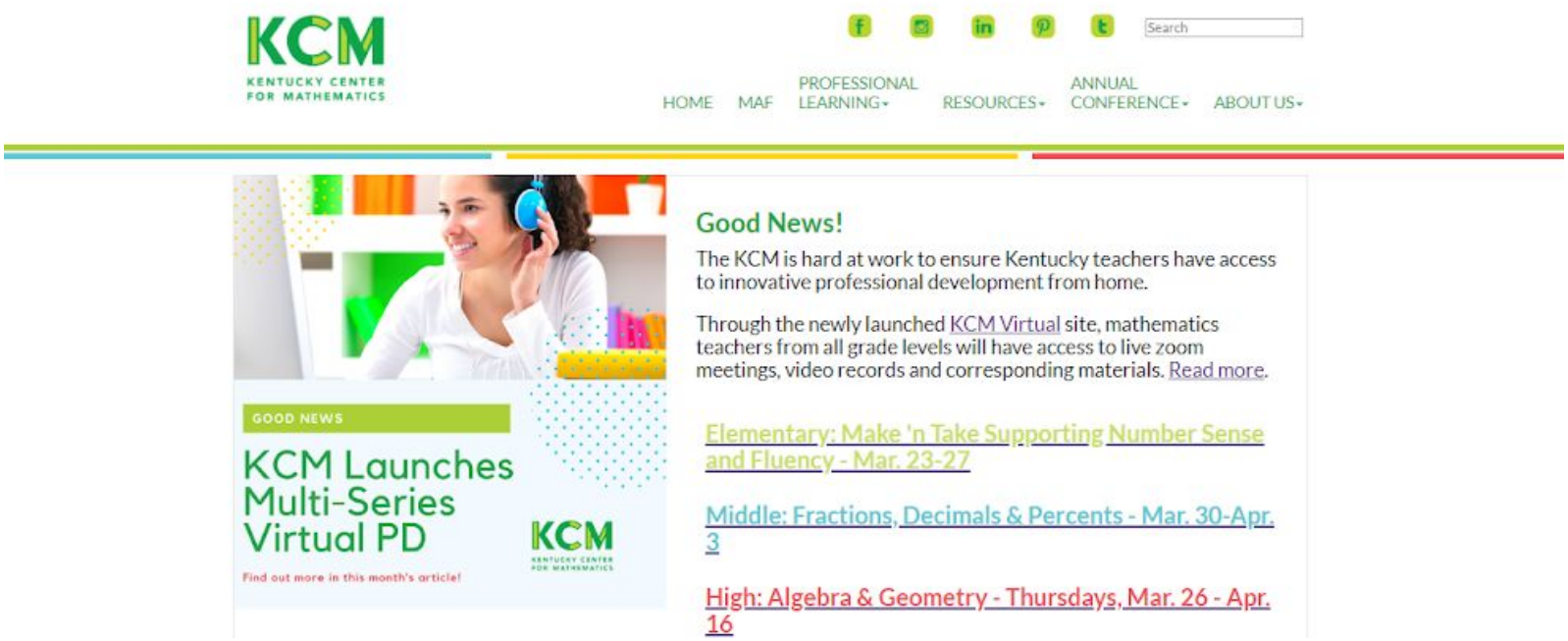
KCM Website

www.kentuckymathematics.org



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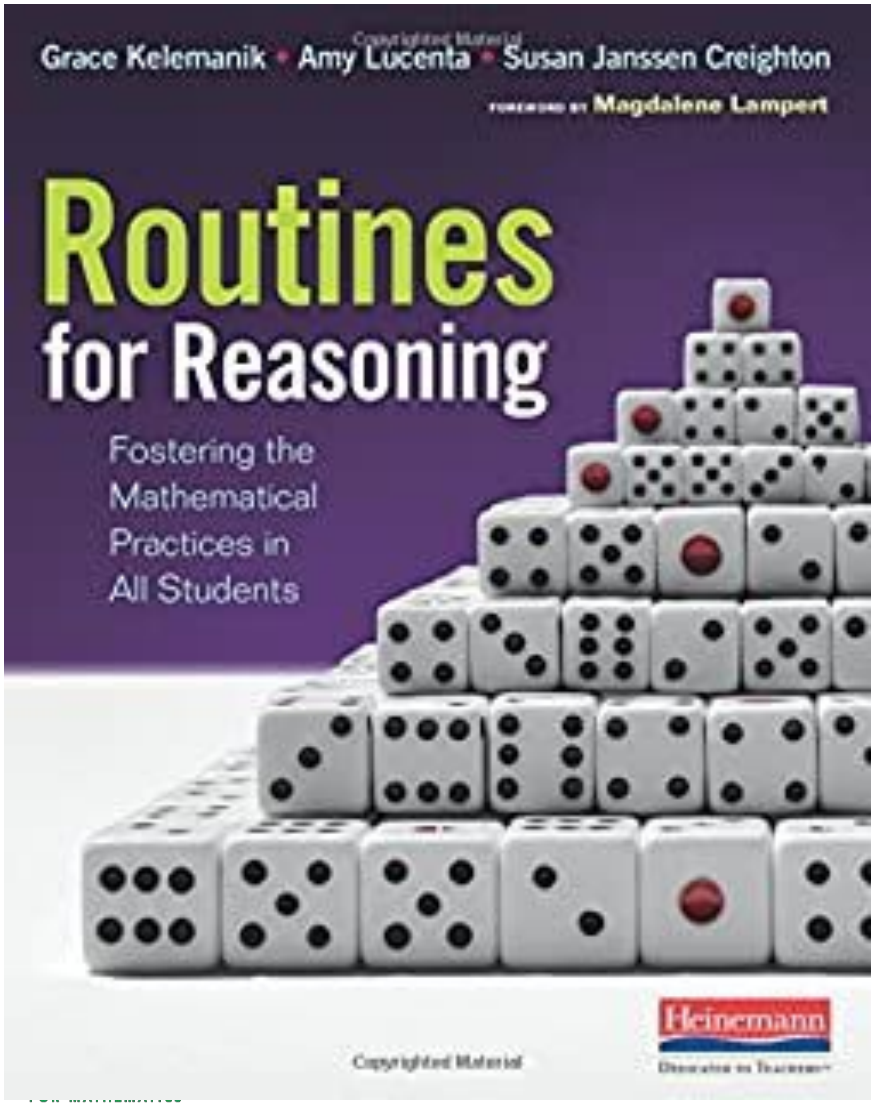
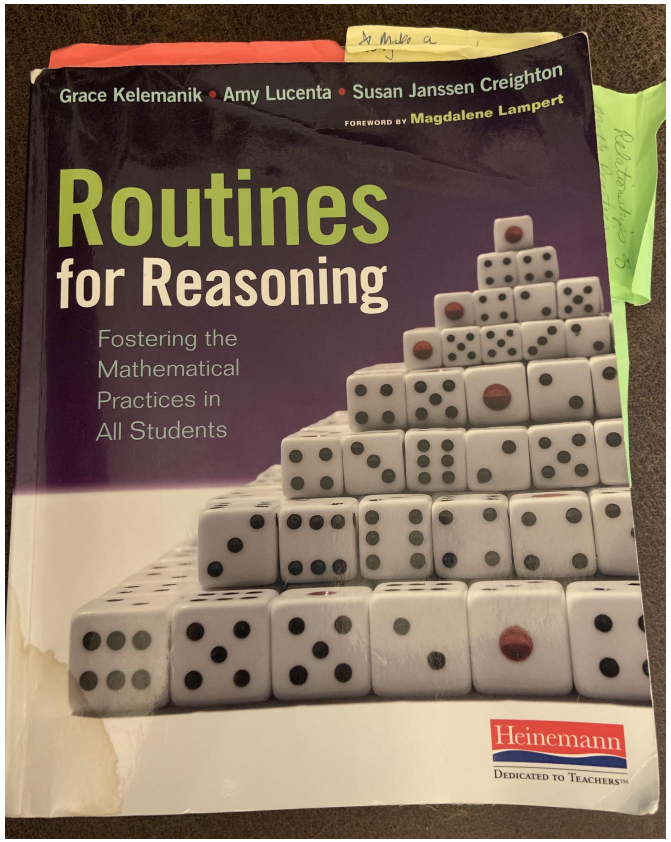


Mine is well-loved!



Why I Love This Book

How many Student Math Practices can you name off the top of your head?

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Why I Love This Book

Avenues of Thinking!

- ➔ **MP1 Make Sense of Problems & Persevere in Solving Them**

- ➔ **MP2 Reason Abstractly & Quantitatively**
- ➔ **MP7 Look for & Make Use of Structure**
- ➔ **MP8 Look For & Express Regularity in Repeated Reasoning**

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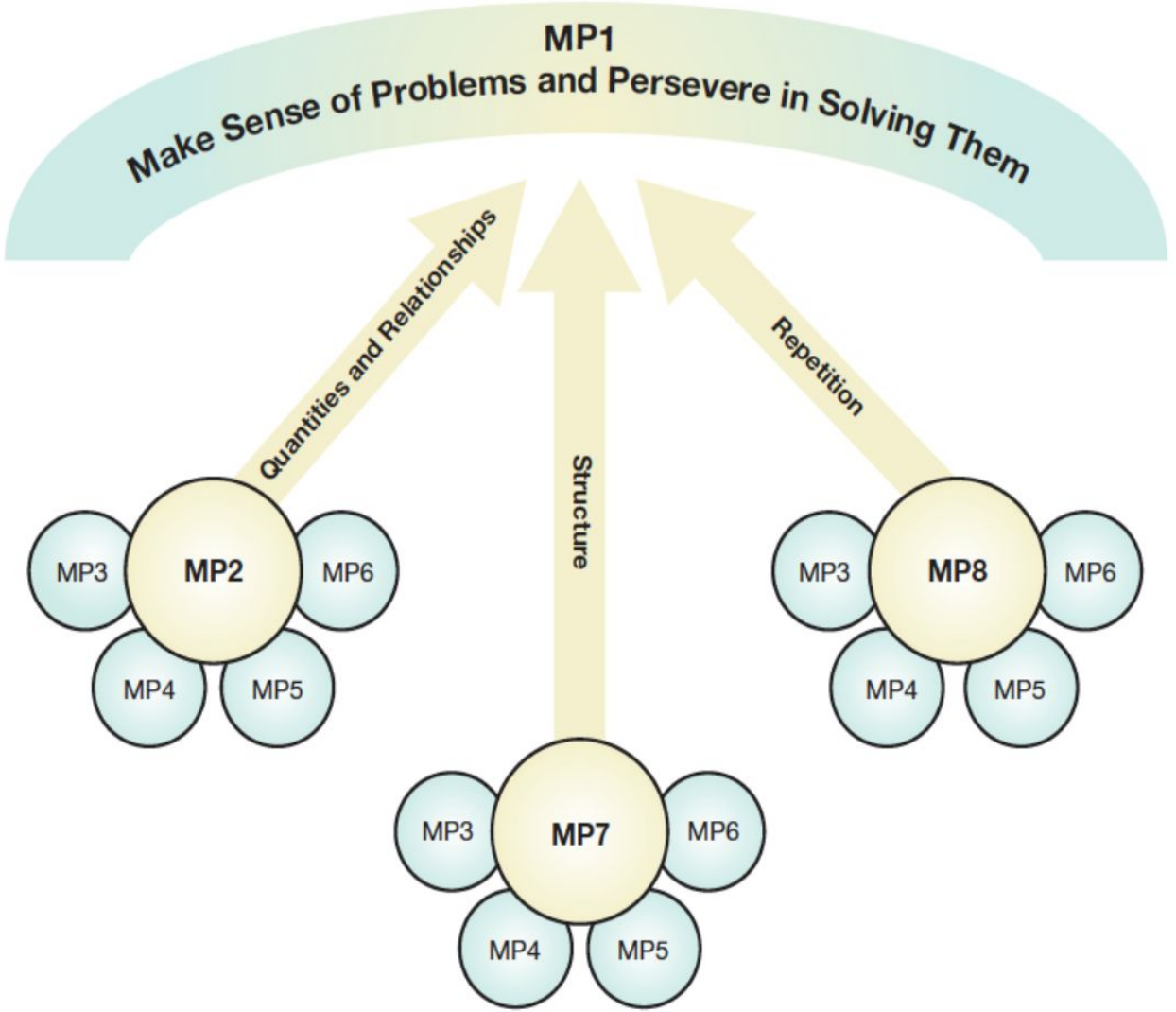
Why I Love This Book



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About the Authors

Grace Kelemanik

Amy Lucenta

Susan J. Creighton

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Why Routines?

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Core Elements

1) articulation of a math practice goal
2) individual think time
3) partner work
4) full-group discussion of ideas
5) final math practice reflection
6) access through multiple modalities
7) liberal use of math practice-focused prompts

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Guiding Principles

"This focus on mathematical reasoning brings to life two of our guiding principles for math practice development: the regular use of cognitively demanding work, and fostering a view of mathematics as interconnected, making sense and doable with effort."

(p. 22)

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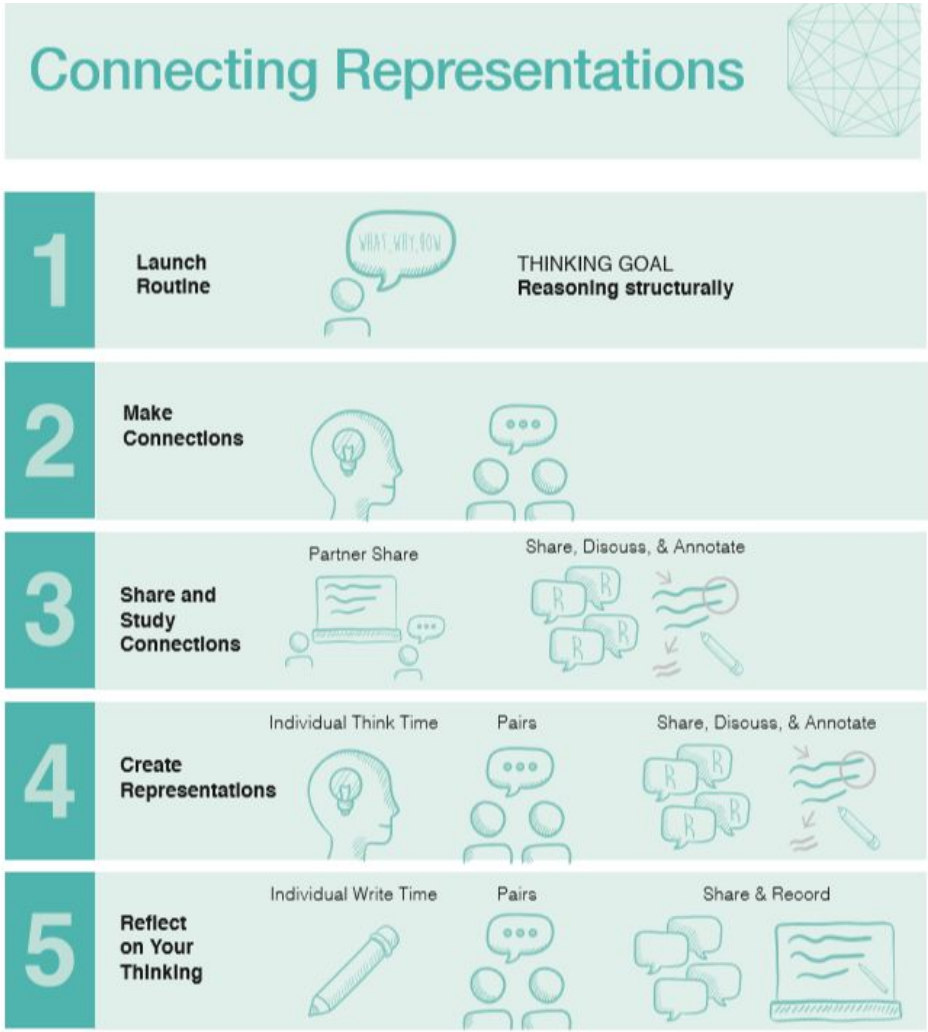
Routines for Reasoning

MP2: Reasoning Abstractly and Quantitatively

Routines for Reasoning

MP7: Look For and Make Use of Structure



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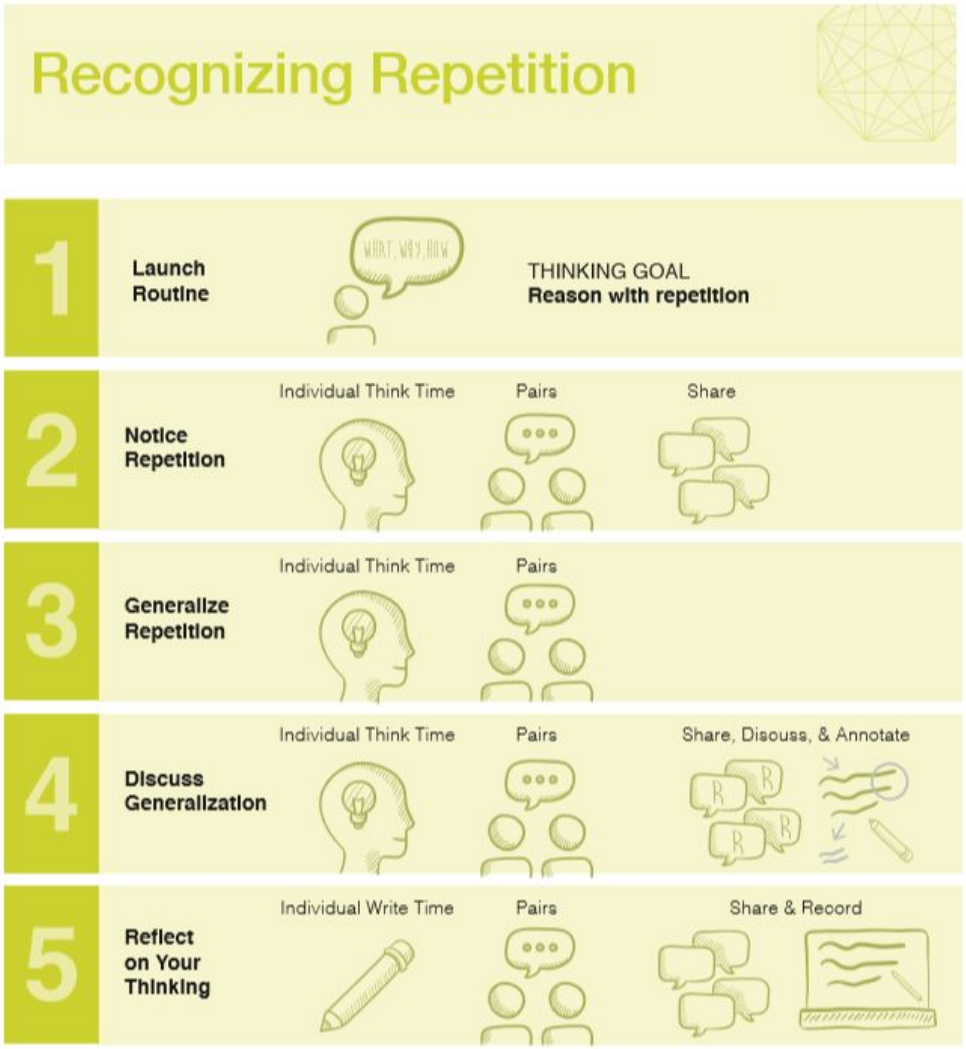
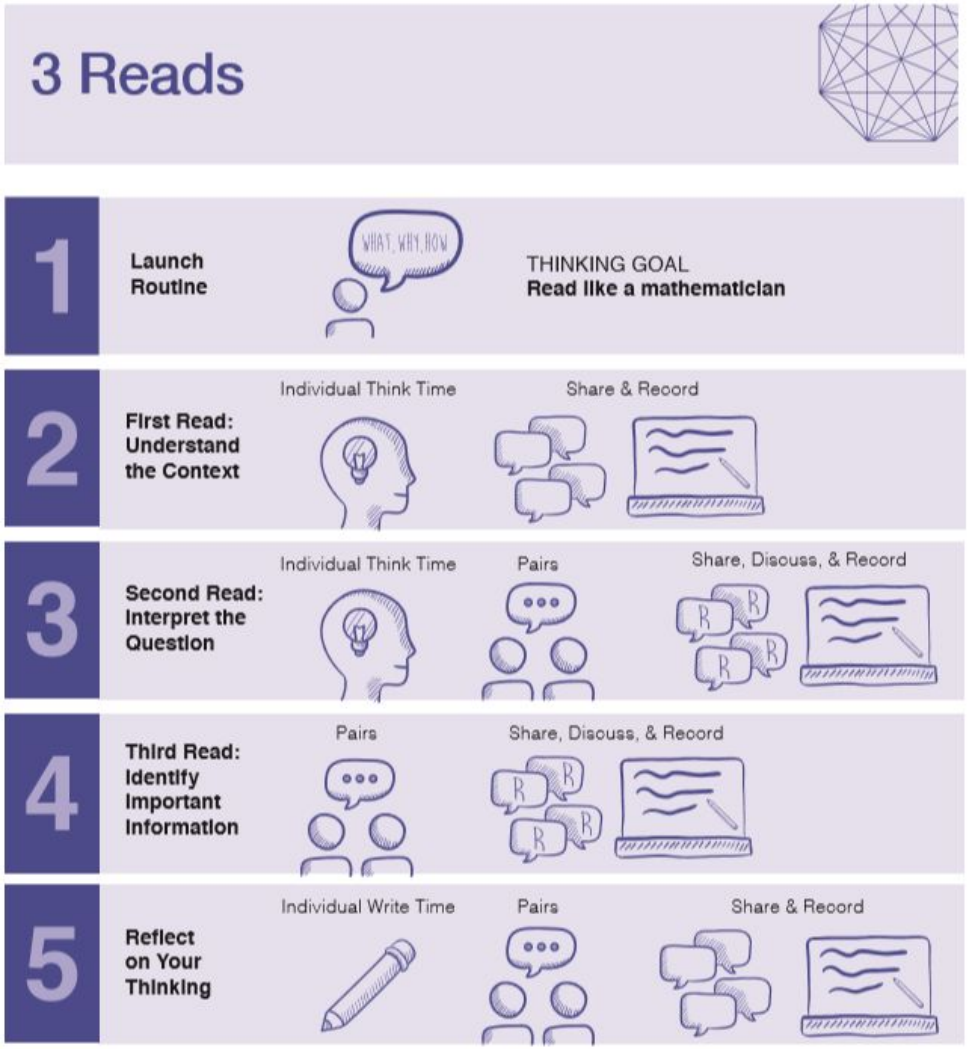
Routines for Reasoning



MP8: Recognize and Express Regularity in Repeated Reasoning

Routines for Reasoning

Enter a Problem and Sustain Thinking



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Essential Instructional Strategies

- Ask-yourself Questions
- Annotation
- Sentence frames and sentence starters
- The Four Rs – repeat rephrase reword, record

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How do you use the 4Rs?

If it's possible that not everyone heard a response…

→ …then the teacher has one or two students ***repeat*** what was said.

If

- the idea is a key part of the lesson, **or**
- The teacher wants to check to see if students understand what was said, **or**
- The teacher isn't sure what a student has responded…

→ …then the teacher has a few students ***rephrase*** the idea using different words.

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How do you use the 4Rs?

If there is specific language students can use to express this idea more precisely…

→ …then the teacher prompts students to ***reword*** the idea using more precise language.

If there are important ideas, words, or images being shared that students would benefit from seeing visually…

→ …then the teacher should ***record*** these ideas to help students process or remember key concepts and participate in the conversation.

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And the 5th strategy is …

Make it Routine!

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Website Support

FOSTERING MATH PRACTICES

Avenues of Thinking | Special Populations | Routines for Reasoning | Related Resources | What We Offer

> "Teaching students to think and reason is perhaps the greatest challenge we face as math educators, and these routines provide clear pathways to do so."

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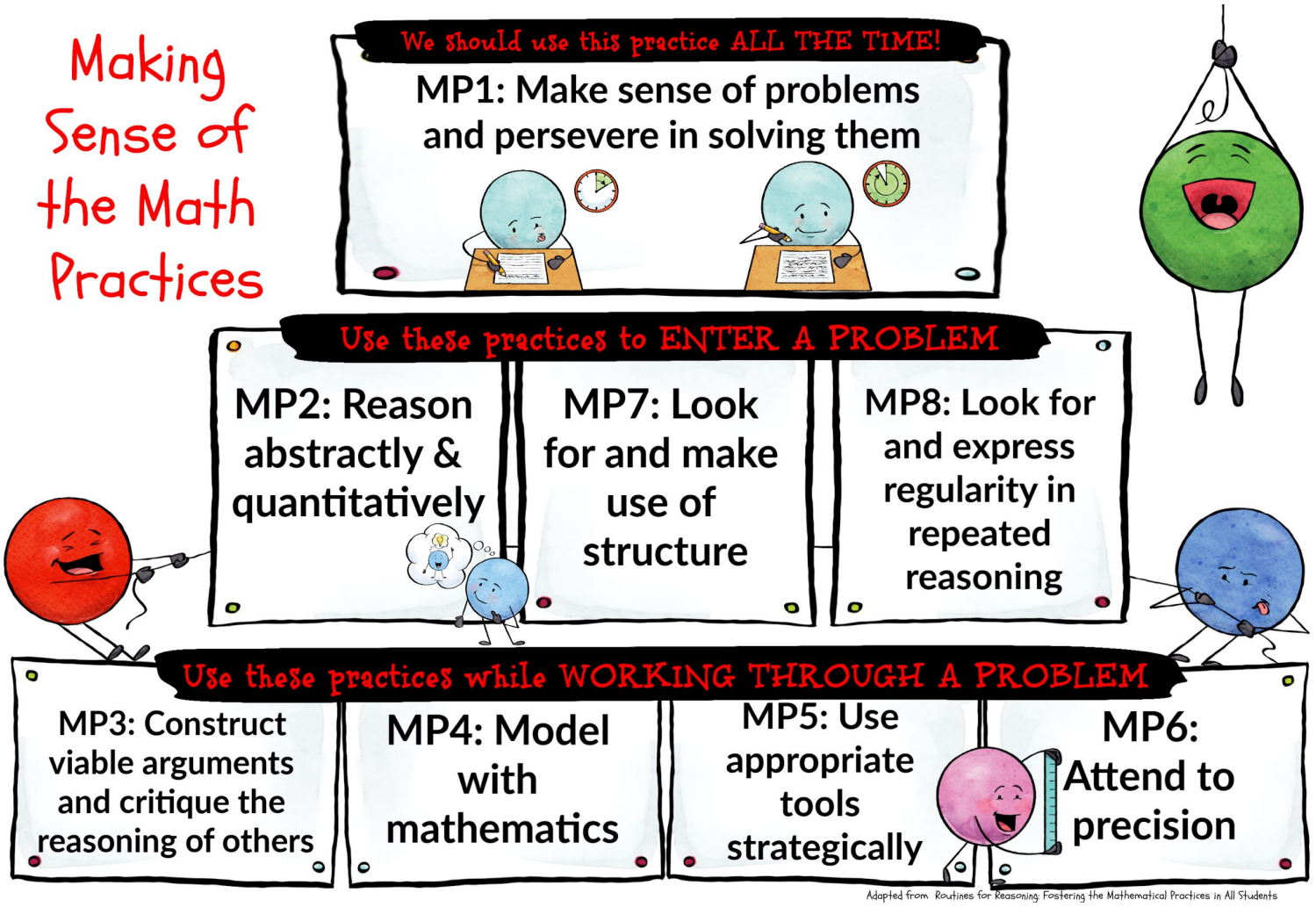
Handouts



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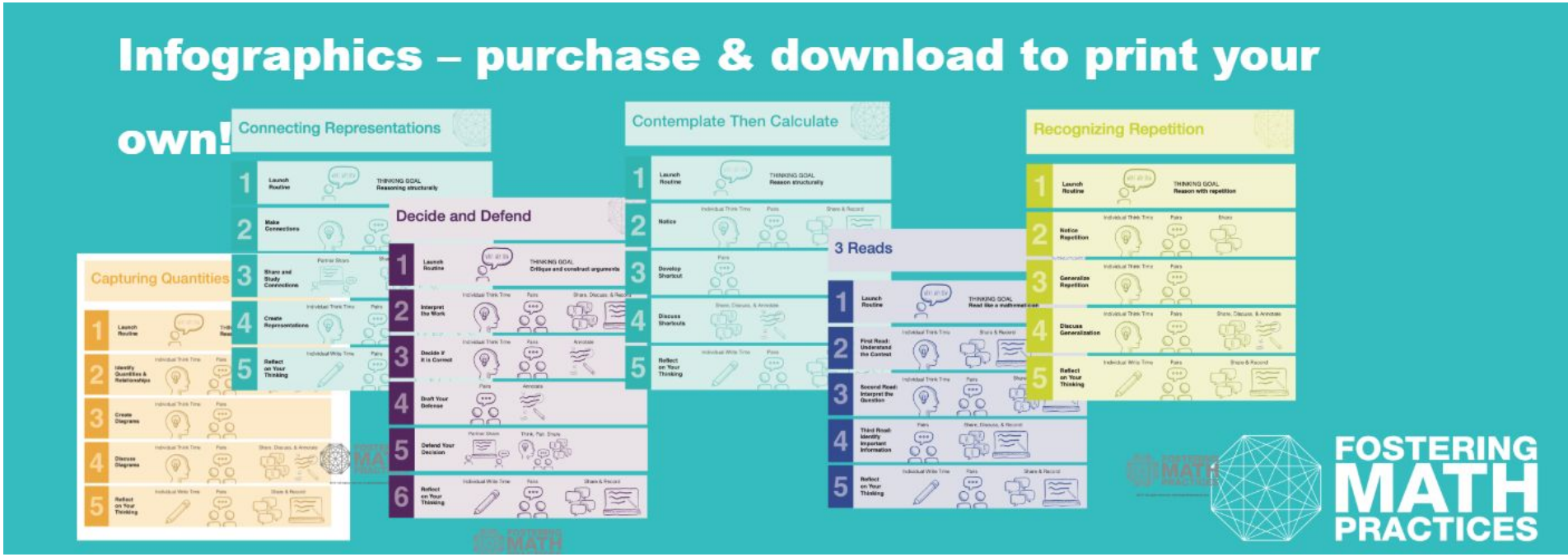
Handouts



All of these are part of your handout packet!

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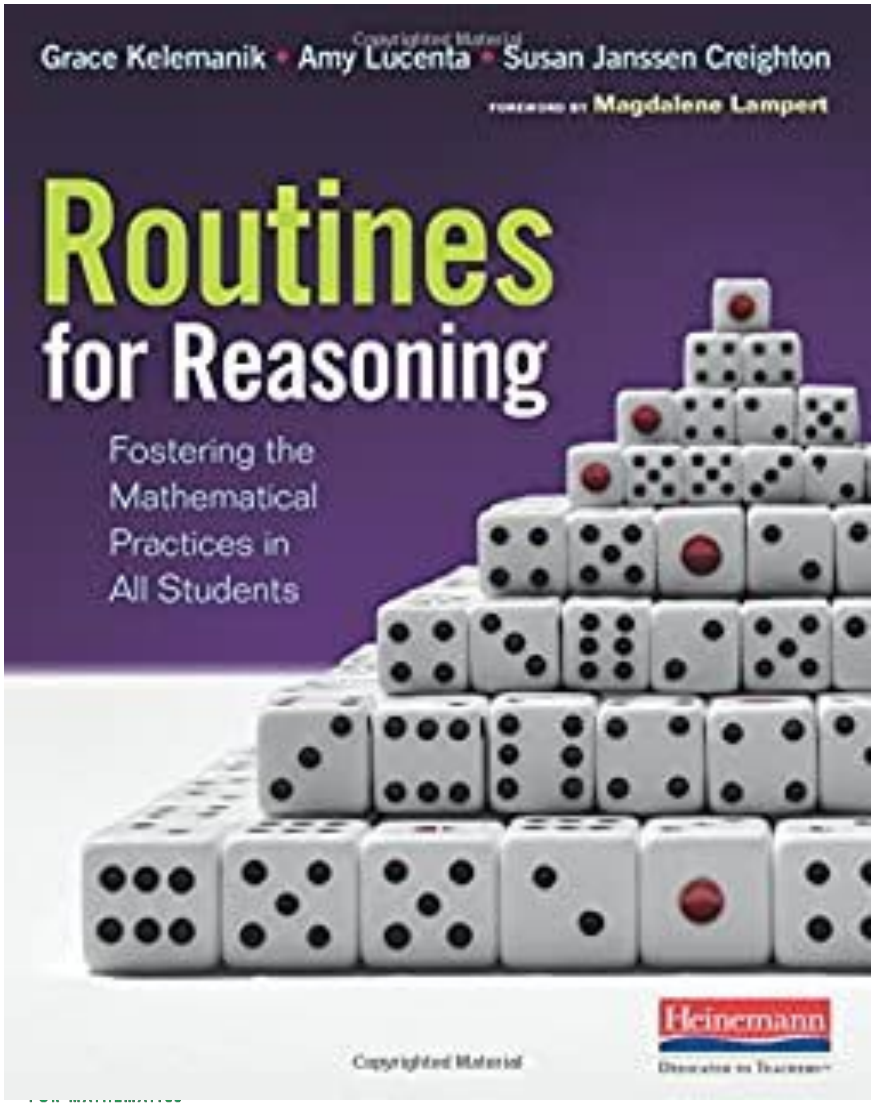

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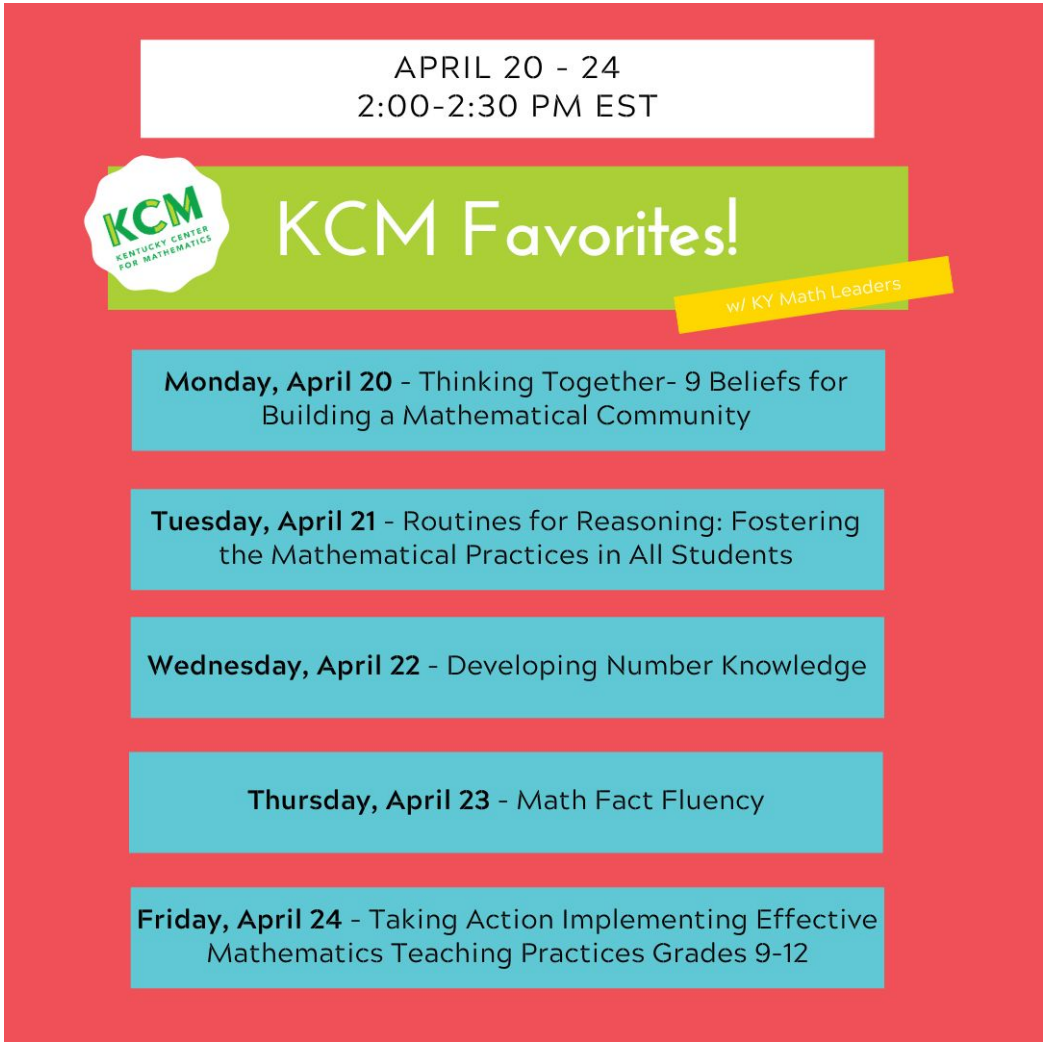

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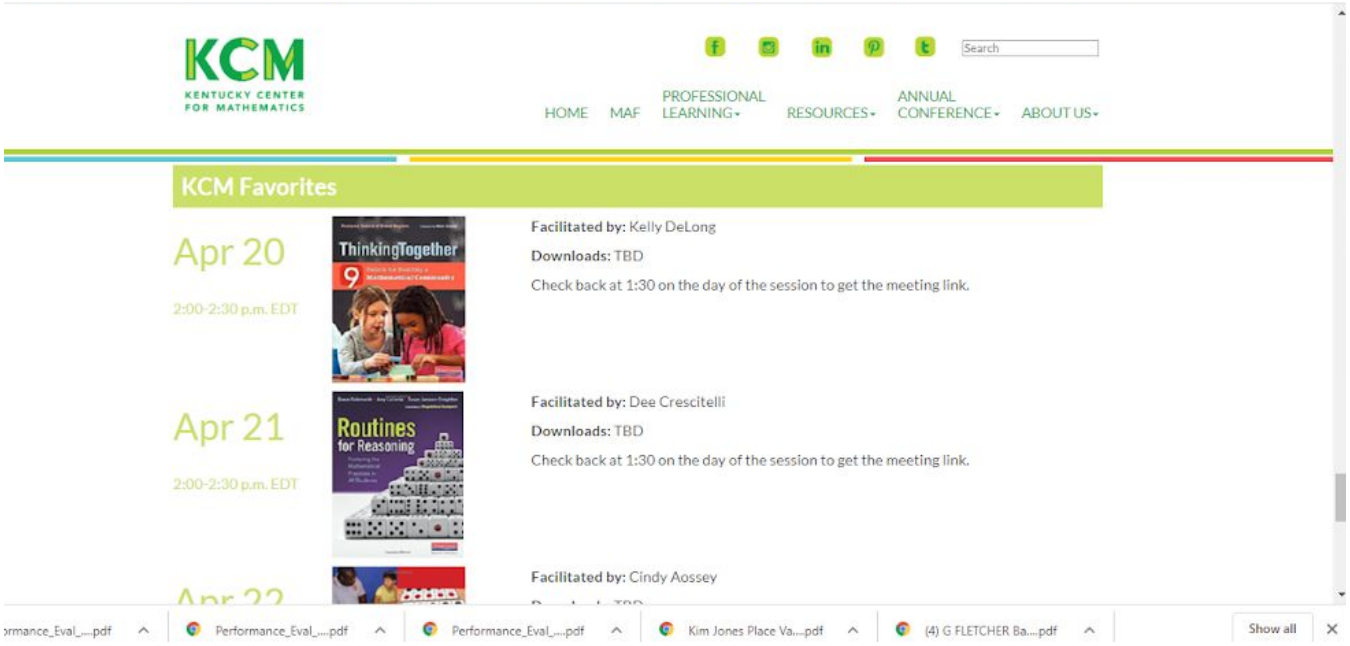

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KCM is here to support you!

Contact me

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