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Strategies for Mathematics Instruction and Intervention, 6–8

By Chris Weber, Darlene Crane, and Tom Hierck

Study Guide

This study guide is a companion to the book *Strategies for Mathematics Instruction and Intervention, 6–8* by Chris Weber, Darlene Crane, and Tom Hierck. *Strategies for Mathematics Instruction and Intervention, 6–8* assists mathematics teachers in structuring strong mathematics programs through adding response to intervention (RTI) to the curriculum and prioritizing which mathematics standards are most crucial.

This guide is arranged by chapter, enabling readers to either work their way through the entire book or focus on the specific topics addressed in a particular chapter. It can be used by individuals, small groups, or an entire team to identify key points, raise questions for consideration, assess conditions in a particular school or district, and suggest steps that might be taken to promote a healthy school culture.

We thank you for your interest in this book, and we hope this guide is a useful tool in your efforts to create a healthy culture in your school or district.

Chapter 1

Prioritized Content in Mathematics

1. What do the authors consider the greatest current obstacle to students gaining the knowledge that they will need to succeed in college or in careers? How has this obstacle manifested itself in your experience with students?

2. Ponder the listed examples on page 13 that highlight the connectedness of mathematics concepts. Then provide your own example that illustrates the connectedness of a few mathematics ideas.

3. Consider Bethany Rittle-Johnson's, John Van de Walle's, and the authors' definitions of *procedural knowledge*. Which definition do you prefer, and why?

4. Why do the authors believe that the terms *concepts* and *applications* shouldn't be considered synonyms? How do they draw distinctions between these two terms in regard to education?

5. What does the phrase "mile wide, inch deep" mean? How may this phrase describe how mastery of taught material is attempted in grades K–8 in the United States, in contrast to the amount of material that is covered in grades K–8 in Germany and Japan?

6. Review the bulleted points given on page 20 for why defining key core content is crucial. What reason for highlighting key core content would you add to this list, and why?

7. In your school, start a dialogue with your fellow mathematics educators to collaborate on next-generation standards to prioritize in your curriculum, both horizontally and vertically. What did you learn from this dialogue?

Chapter 2

Designing Conceptual Units in Mathematics

1. List the five steps that educators should take in forming conceptual units. What do the authors consider to be the key lever of RTI, and why is it pivotal to designing a unit of instruction?

2. What is the most prominent form of assessment used in schools? What is the only learning target that this kind of assessment is equipped to assess?

3. Why is it important that educators commit to performing midlesson checks for understanding and that they pass out end-of-lesson exit slips in order to inform their lessons?

4. What are the five essential questions that teacher teams should collaboratively answer when they examine common assessments that are given during and after units?

5. How can collaboratively developed scoring guides ensure that teams of educators have a common understanding of proficiency? What must teacher teams do in order to accurately use scoring guides?

6. How can an understanding of self-assessment benefit students? How can they grow from self-assessment, and what can they do when they start to self-assess?

7. Why is it no longer sufficient to just require students to show their work and reach correct answers? What must students instead be able to do in order to gain conceptual understanding of what they have been taught?

8. What are the eight mathematics abilities that students should have if they are to be successful 21st century learners?

Chapter 3

Instructional Practices for Application-Based Mathematical Learning

1. Consider the practices that the NMAP identifies as effective influences on student learning, listed on page 50. Which one have you found to be the most crucial, and why? On which of these instructional practices do you think you need to do the most work?

2. How have you incorporated real-world applications of mathematics into the classroom to help students see how mathematics surfaces in their everyday lives and how employing mathematics can help them through life problems?

3. What is a *virtual manipulative*? What do the authors suggest that concrete manipulatives and virtual manipulatives be used to do?

4. In your own words, define *assessment* as *learning*, *self-regulated learning*, and *metacognition*. How are these terms interdependent, and how are they different?

5. How can writing in a journal help students with their mathematical learning?

6. Should all parts of mathematical learning include metacognition? Why?

7. What did observational research find to be a main difference between the questioning techniques of teachers in the United States and the questioning techniques of teachers in China?

8. In what ways do you devote classroom time to ensuring that students cultivate the mathematics vocabulary they need? How do you work to use terms consistently so that alterations in meaning do not hinder students' learning?

Chapter 4

Tiers 2 and 3 Approaches to Foundational Conceptual Understandings and Mathematical Practices

1. What do the consequences of skipping over Tier 2 supports often include?

2. Without prioritized Tier 3 interventions, what will students with substantial deficits not be able to do?

3. What are the three broad domains in which to focus mathematical learning for kindergarten through grade 5 in order to guarantee clarity for teachers and students? What are these domains the building blocks for?

4. In your own words, define *number sense*. What does number sense serve as the basis of?

5. What are the three facets of mathematics that students must conquer?

6. When do initial experiences with measurement and data have the most meaning?

7. Contemplate a technology-based resource your school has invested in or is considering investing in, and answer the questions on pages 116–117 about the resource. What is important to keep in mind about technology's role in instruction?

Chapter 5

Integrating Assessment and Intervention

1. The authors highlight that teachers' confidence and productiveness positively influence student mathematics achievement and that teachers must help students grasp that their mathematics attainment relies on diligence rather than inherent skill. What do you do to enhance your and your students' confidence?

2. The authors state that school staff should end the school year by compiling a list of students requiring intensive supports for foundational skills at the beginning of the next year. How do you assemble information on students so their future teachers are prepared to support their learning? What could you do to improve your current end-of-the-year screening practices?

3. Consider the examples featured on page 121 of what educators *can* predict and what they *cannot* predict regarding students' comprehension and performance of mathematics concepts. What *can* and *cannot* statements of your own would you add to the provided examples?

4. Carry out the diagnostic activity the authors describe that involves sitting with a student for twenty minutes to present grade-level-appropriate mathematics problems and to

observe his or her mathematical thinking by asking questions about his or her process. What knowledge about this student do you gain from the diagnostic activity, and how may it influence the supports you provide to this student?

5. What needs do Tier 2 and Tier 3 interventions address? When are these supports necessary?

6. What is a *buffer*?

7. Review the list of indicators that can gauge an RTI's success, featured on page 137. What indicator would you add to this list, and why?