Study Guide for Professional Learning Communities

Study Questions for Mathematics in Focus, K–6

Chapter 1

1. Why might you want to build focus into your mathematics curriculum and instruction?
2. How do you see a structure like a planning tree helpful in focusing instruction?
3. What barriers do you see in using this structure to focus instruction in your existing mathematics curriculum? How might you address these barriers?
4. Look back at the Planning Tree in Figure 1–1. What is the difference between the emergent structure (Fractions) and the emerging understanding in the box at the top of the tree?
5. Select a topic at your grade in your curriculum and use the planning tree template in Appendix A to identify the major components of that topic. What is the major emergent mathematical structure (the topic box on the trunk)? What emerging understanding do you want students to develop (the box at the top of the tree)? What foundational ideas (the roots) do students need in

order to work toward this understanding? What ideas do students need to develop and connect together (the branches) to develop the emerging understanding?

Chapter 2

1. What are the benefits of using a lesson template to focus instruction?
2. What do each of the components in the lesson template contribute to the planning of focused instruction?
3. How would using this lesson template change the way you think about planning instruction?
4. Which components are you already incorporating in your lessons?
5. Which ones are new to you? Pick one of the new components and make a plan to include it in your next lesson design. Share with another teacher how it worked.

Chapter 3

1. Why should you have classroom conversations? What might you want to accomplish with a classroom conversation?
2. At what point within a lesson might you expect to have an important classroom conversation?
3. What information might you expect to glean from careful management of classroom conversations?
4. How do you currently use classroom conversations as a part of your lesson structure?
5. How might you change your use of classroom conversations to better focus instruction?

Chapter 4

1. What are the benefits and drawbacks of identifying priorities in grade levels?
2. In the NCTM Focal Points, there is no Focal Point about data until grade 8. How can teachers in earlier grades develop some of the prerequisites needed to prepare students for the focus on data in grade 8?
3. How could you convince your principal that identifying curricular priorities and integrating student expectations is an efficient and effective way of teaching mathematics?
4. Review your grade level's mathematics curriculum, and select two important ideas that would benefit from being integrated. Explain your reasoning as you would in the Rationale and Objectives section in the Lesson Template.
5. During the activity and the summary discussion, what kinds of questions could you ask students in order to help them integrate these ideas?

Chapter 5

1. Why should a teacher at any grade level think carefully about adding content to address accountability needs for the next grade level?
2. In what ways does an attempt to address the tension between accountability goals and the time needed for understanding impact curricular planning at the classroom level, campus level, and district level?
3. What should you consider when deciding what your students must spend time on to be successful in the next grade?
4. Identify two or three important mathematical ideas to focus on that you really want your students to understand as a result of spending a year with you. Identify or create some items or tasks

that will provide you with information about how well they have learned these ideas.

5. Share your items/tasks with colleagues from grade levels immediately below and above you. How do your ideas fit together to provide students with a complex web of interconnected mathematical ideas? How well do these curricular connections address accountability needs?

Chapter 6

Most mathematical ideas can be represented in a variety of ways, such as concrete models, pictures, graphs, words, and numbers.

1. Why is it useful mathematically to understand the connections between two different representations of an idea?
2. Why should you pay attention to helping students make connections among representations when planning instruction?
3. What management issues would you have to deal with to focus instruction on making connections among multiple representations?
4. Identify a topic you teach. What kind of representations would be useful to develop student understanding of this topic?
5. How would you help your students make connections among the different representations to strengthen their understanding?

Chapter 7

1. What is the purpose of having a variety of resources available for designing instruction?
2. How do you decide which activities you want to add to your collection of resources?
3. How do you decide which activities to use in a particular lesson?
4. Think of a math concept for which you have lots of activities available. Which of the activities are worth your time (and your stu-

dents' time)? Which of these activities are fun but not very rich mathematically? Which ones address conceptual development? And which ones provide challenging applications? Justify your choices.

5. If you could use only one of these activities to focus your students' thinking on this important mathematical idea, which one would you choose? Why?

Chapter 8

1. Why is it important for teachers and students to find connections between the mathematics found within the four walls of a classroom and the broader world beyond?
2. How do you incorporate real-world contexts into lessons without losing the focus on the important mathematics?
3. When a student asks "Why do we have to learn this?" what kind of responses would make the math meaningful for them?
4. What are some ways you have made mathematics meaningful for your students?
5. Choose a topic that you have trouble motivating students to learn. How might you use a real-world context to make it meaningful for them?

Chapter 9

1. How can you differentiate instruction and maintain mathematical focus?
2. What are some characteristics of a lesson that can provide opportunities for differentiated instruction?
3. If differentiation involves adapting instruction to students' needs, how can you make sure that it is equitable for all students? For example, if instruction is differentiated with the use of technology,

can everyone get to do something interesting? Can everyone learn the important mathematics they need to learn?

4. Select a lesson that addresses an important mathematical idea at your grade level. From your knowledge and previous experiences, describe some difficulties that you think students might have in this lesson. Don't forget to include difficulties that might be exhibited by high-achieving students, such as an inability to describe their quick thinking.
5. Suggest some adaptations to the lesson that would address the difficulties identified in Question 4 and maintain the mathematical focus of the lesson.