

CHAPTER 7: Mathematicians Ask Questions

In this chapter, we'll explore giving students opportunities to pose problems and ask questions, not just answer someone else's questions.

Discussion Questions

Page 137 In your math class's current state, how often do your students have opportunities to pose mathematical questions? How much time do you think you can manage for student questioning? Discuss or write.

Pages 150–152 Discuss the stock market independent study. What does it make you think about? Do you see opportunities for all your students to pursue their own interests in mathematics?

Pages 154–156 Discuss Debbie's choices around what to do with students' questions. How much freedom and structure did she provide? Her approach can sound scary. Especially if it does, make sure to talk it through with your colleagues.

Page 169 Now that you've read how it went, discuss the prior question again. What did you notice? What new thoughts are you thinking?

Page 169 Discuss or write about how Debbie handled vocabulary in the geometry exploration. What can you take away from her example?

Page 169 What do you make of the timing of students' questioning at the beginning, during, and at the end of this unit (rather than just at the beginning)? Discuss or write about *when* students can ask questions.

Page 169 Discuss the section on standards. Debbie never wrote an objective on the board, yet her students engaged in a rich exploration of the standards. In your teaching context, how might you give students opportunities to uncover the standards through inquiry?

Activities

Pages 139–141 **Play with 101questions**

Open up 101qs.com and play for a few minutes. Give yourself time to explore *before* you think about teaching it.

Pages 153–154 **Are Shapes Math?**

Allow yourself to be inspired by Debbie's kids. What questions do you have about shapes? Generate some. Coaches, perhaps you can find time for teachers to investigate their own mathematical questions.



CHAPTER 7: Mathematicians Ask Questions (continued)**Calls to Action****Pages 139–141** Teach 101questions

Try five different *101questions* with you students, as your schedule permits. How did it go? What changes did you notice as students gained experience? Share your findings at tjzager.com (Chapter 7).

Pages 141–145 Notice and Wonder

Read the blogs about *Notice and Wonder* (gathered at tjzager.com, Chapter 7), and then try a couple in your classroom. Pay attention to who participates. What do *you* notice? What do *you* wonder? Tell me about it at tjzager.com (Chapter 7).

Pages 145–147 Problem Posing

Consider Sheryl's investigation with the fish eggs. Is there a data set you could provide students so they could practice generating mathematical questions? Try it and see! Report your findings and read about other teachers' experiments at tjzager.com (Chapter 7).

Pages 147–150 Riffing

Choose a rich problem from an upcoming lesson and plan how you might give students the opportunity to springboard off their first solution. The questions "What new questions do you have?" or "What are you wondering about now?" might help. What new questions did students generate? Share them at tjzager.com (Chapter 7).

Additional Resources

At stenhouse.com/becomingmathteacher and at tjzager.com, you'll find a collection of supplemental resources that may come in handy for further thinking and discussion. I keep the links fresh, so the contents will change, but you will certainly find:

- 101questions
- Lots of information about *Notice and Wonder*, including several blogs from different grade levels and a short talk from Annie Fetter from the Math Forum
- References and articles about Van Hiele levels and resources for teaching geometry with questions at the heart, such as *Which One Doesn't Belong?* from Christopher Danielson

