

**CHAPTER 4: Mathematicians Make Mistakes**

Over the past several years, there has been quite a bit of encouraging talk in the math world about seeing mistakes as a normal part of learning and doing mathematics. Jo Boaler, in particular, has led the charge. Most teachers want to do a better job of handling mistakes in the math classroom but are unsure about how to proceed. In this chapter and the next, I offer several specific teaching techniques to try, as well as a larger argument about why you'd want to.

**Discussion Questions**

**Page 56** Discuss or write about Yau's quote:

*Somehow he conveyed the philosophy that making mistakes was normal and that passing from mistake to mistake to truth was the doing of mathematics. And somehow he also conveyed the understanding that once one began doing mathematics it would naturally flow on and on. Doing mathematics would become like a stream.*

What thoughts do these images spark in you and in your colleagues?

**Page 57** Discuss or write about the list of teacher's comments. Reflect on the language you currently use when students make mistakes. What language might you use going forward? How will you remind yourself?

**Page 63** Consider the paragraph about keeping your face, body language, voice, and words neutral. How do kids pick up cues from you? How can you stay encouraging, honest, and neutral all at the same time?

**Page 69** Reflect on the moment Heidi turned to Ayoka and asked, "What do you think?" Did it surprise you? If so, why? What is a more typical response here? How did Heidi's response work out? What message is Heidi conveying to her class about making sense of mathematics? About who holds authority in math class?

**Page 71** Discuss or write about Heidi's rationale for digging into Ayoka's work. What do you think about her thought process?

**Pages 72–73** Heidi said, "I don't understand it yet." Would you feel comfortable and relaxed saying this to students? To colleagues?

**Pages 76–77** Read and reflect on the section "Responsive Planning—Students' Mistakes as Teachers' Guides." How do you determine when a mistake is worthwhile to take up as a class versus handle individually?

**Activities**

**Page 78** **Intuition and Sexism**

Watch Reshma Saujani's *TED Talk* "Teaching Girls Bravery, Not Perfection" together. It's linked on the companion website and blog. Discuss it alongside the closing section of the chapter about equity. How might these ideas influence your teaching?



**CHAPTER 4: Mathematicians Make Mistakes (continued)****Calls to Action****Page 57 Mistakes Versus Errors**

What do you make of the distinction between mistakes and errors? Next time you're teaching, jot down mistakes you hear that reveal conceptual misunderstanding and errors that reveal students' need to work on precision. The line between the two is blurry, but how does distinguishing the two affect the way you think while teaching? Discuss or write about your notes with your colleagues and post them at [tjzager.com](http://tjzager.com) (Chapter 4).

**Page 63 Opening Discussions**

Consider taking up Julie's approach to opening questions. Next time you start a discussion, ask a thought-oriented question rather than an answer-focused one. What happened after? Share your results at [tjzager.com](http://tjzager.com) (Chapter 4).

**Pages 76–77 Anticipating Mistakes**

Choose an upcoming lesson. Are there mistakes you can anticipate and welcome? Teaching opportunities you can count on? Gather with some colleagues to plan the lesson, and dedicate some time to anticipating mistakes and opportunities together. Teach the lesson, and then come back together to talk about whether this anticipation helped you and in what way. Report back at [tjzager.com](http://tjzager.com) (Chapter 4).

**Additional Resources**

At [stenhouse.com/becomingmathteacher](http://stenhouse.com/becomingmathteacher) and at [tjzager.com](http://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:

- A link to Michael Pershan's *Math Mistakes* blog, which has extensive sets of mistakes you and your colleagues can discuss
- Short videos and links about some of the mathematicians mentioned in this chapter (Henri Poincaré, Fern Hunt, Shiing-shen Chern)

