Preface

How I Came to Write This Book

My goal when entering college was to become a teacher. I'd always liked school, often played school at home with my sister and friends, and earned good grades. I'd always done particularly well in math and was interested in learning more. So I decided to major in mathematics and become a math teacher.

When I got to college, I was especially curious about the mysteries of calculus (which wasn’t taught in my high school). But while math always made sense to me in my earlier studies, when I began studying calculus, I had a very different experience. I was completely lost. My first professor was caring and kind. She gave lectures and filled the chalkboard with symbols often new to me to reveal ideas that were also new.

In her lectures and in those other professors gave in subsequent classes, there always was a moment that triggered my downfall. The professor would say, nearing the end of an explanation or proof, “So you can now see that . . .” or “It’s now obvious that . . .” or “Because of this, it’s now clear that . . .” But for me, “now” rarely came. I often didn’t “see” what they saw, nothing was “obvious” to me, and little was “clear.” I earned my math degree, but it was very, very difficult.

I hit my mathematical wall in calculus, the way many teachers have told me they experienced in their math learning, sometimes with subtraction, sometimes with fractions, other times with algebra or geometry. Many elementary teachers have shared with me that in college they took only the math that they absolutely had to take. Many have taken the oath that math is not their thing.

With the difficulty I was experiencing, I stuck with math in college. In my classes, I copied down everything the professors wrote with the diligence I had developed in high school. I filled notebooks. I did my homework and prepared for exams, more times resorting to memorizing than understanding. I earned the degree. Today I’m fine with the content of math through high school, but I still feel inadequate with much of what I studied in college. And while these experiences in college were more than fifty years ago, I can still conjure up the feeling of being a poor math student. In a way, I think that my feelings mirror what some teachers have told me they remember about being sent to the board in elementary math classes. The feelings run deep.

There’s an upside to this story. When I became a teacher, I made some promises to myself. I would never, never cause a student in my math class to feel deficient. I wouldn’t tolerate students feeling demeaned by math. I would do all that I could to help students build the understanding of the math they were learning as I had somehow built successfully through high school math. I would never say things like “So you can now see that . . .” or “It’s now obvious that . . .” or “Because of this, it’s now clear that . . .” I was going to be a different kind of teacher.
But what it meant to be a different kind of teacher wasn’t clear to me, and the journey to figure it out has been the main quest of my teaching career. Even with this goal, in my beginning years of teaching when I taught eighth and ninth graders, I reverted to teaching the way I had been taught. I filled the board as I taught, the students listened, and then I circulated as they did assignments. I planned my lessons carefully, working on how to explain fractions, algebra, or geometry by relying on how these topics had been explained to me. Explaining was the only way I knew to try to make things plain for students. Oh, my, how much time I took to plan those lessons.

My lessons worked for some students, as they had worked for me when I learned math before attending college. But I was painfully aware that they didn’t work for other students. I realized that I was doing to some of my students just what my well-meaning math professors in college had done to me.

That’s when I started my search for how to be a better math teacher. And that search took me in several directions: I had to learn more about the math I was teaching—more about whole numbers, fractions, algebra, and geometry. As I became fascinated by how younger children dealt with math and moved down to the earlier grades, I thought more about what it really takes for students to learn the basics of mathematics, both to understand concepts and also to develop a repertoire of skills. And, of course, I had to figure out how to establish and manage a classroom that gave students access to the mathematical content and also helped them become mathematical learners.

There was not a straightforward path for this learning. There was no sign saying “Marilyn, this way.” I engaged with colleagues, learned from my students, took classes and workshops, attended conferences, and read many resources. I studied in earnest, this time not to pass exams to get a degree. I already had the degree. Now I studied so I could feel like a good teacher of mathematics. And that meant being more than just adequate, but really, really effective. I wanted my students to become competent and confident mathematically. But I also wanted them to be interested in math, curious about new math ideas, willing to take risks and plunge into solving new math problems, and also see math as engaging and playful.

It’s in this spirit that I offer this resource, which has been a work in progress for more than half of my teaching career. I wrote the first version in 1981, revised it in 2000, and then again in 2007. And here, in 2015, is my newest edition. So, in an important way for me, this resource has been a major part of my journey as a teacher. I’m still on that journey, and I invite you to come along with me. I hope that this fourth edition of *About Teaching Mathematics* helps you meet the challenge of helping your students become successful learners of mathematics.

_Marilyn Burns_