Introduction to the
Fourth Edition

Many documents have been made available over the years to help teachers think about teaching elementary mathematics. In 2000, the National Council of Teachers of Mathematics (NCTM) published Principles and Standards for School Mathematics to address teaching mathematics in all the grades. In 2001, the National Research Council released its report, Adding It Up: Helping Children Learn Mathematics, to explore how students in pre-K through eighth grade learn mathematics. In 2006, NCTM published Curriculum Focal Points for Pre-Kindergarten Through Grade 8 Mathematics offering a step toward a national dialogue about a coherent curriculum and defining the content to be emphasized at each grade level. In 2010, supported by the Council of Chief State School Officers (CCSSO) and the National Governors Association Center for Best Practices (NGA Center), the Common Core State Standards for Mathematics were released to define what students in kindergarten through grade 12 should understand and be able to do in their study of mathematics.

Along with these major documents, states and school districts have prepared frameworks of specific expectations about what teachers are to teach and when. Instructional programs and other curriculum resource materials provide teachers suggestions and road maps for teaching math. Online websites make available teaching ideas and video examples. State and local tests further impacts teaching choices.

It’s a dizzying amount of material, daunting for teachers to sift through, digest, and use to help students successfully acquire the math knowledge, skill, and confidence they need.

My goal in writing About Teaching Mathematics has been to connect the major ideas and suggestions from these many documents to the reality of classroom teaching. In a way, I’ve tried to translate the major ideas in the documents to best instructional practices, to make these ideas accessible and helpful for classroom instruction. I realize, and confess, that a particular point of view has evolved for me over the more than fifty years I’ve been involved with mathematics education, which is to offer students opportunities to think, reason, and make sense of mathematics and to settle for nothing less. With that in mind, I’ve written this book to help teachers

- deepen their knowledge and appreciation of mathematics;
- understand how students learn mathematics;
- implement effective instructional strategies for teaching mathematics;
- make assessment an integral part of informing mathematics instruction; and
- establish classroom environments that support students’ learning of mathematics.
What’s New in the Fourth Edition?

Over the years, I’ve often dipped into my own copy of About Teaching Mathematics, Third Edition, for ideas as I’ve prepared to teach classroom lessons. My personal copy is woefully dog-eared and filled with notes, some scribbled in the margins and some on sticky notes. In this fourth edition, I’ve reproduced many of these notes from my own copy of the book and added new ones as well. (This idea came from a gift I received from a friend a few years ago. She gave me a copy of her favorite cookbook that included her own notes written throughout the book. Her annotations were enormously helpful and made the cookbook more personal and accessible.) Some of my notes are reminders of improvements I’ve made to teaching ideas, some are references to other related parts of the resource, and some are references to other resources I found helpful or informative. I offer them as assistance for planning lessons, and I encourage you to add your own notes and share them with colleagues.

Overview of Changes and Additions

Part 1

I’ve made a major overhaul to Part 1, “Starting Points,” to present how my thinking has evolved on some of the issues that were included in the third edition and to add sections that reflect my current thinking on other issues. Organized into six categories, each of the twenty-three Starting Points engages with a particular issue and draws on my years of teaching experience to tie it to classroom instruction.

Part 2

In Part 2, “Problem-Solving Investigations,” I continue to draw on my classroom teaching experiences, here organized not by issues but by the content areas of math instruction—measurement, data, geometry, patterns and algebraic thinking, and number and operations. Each content area includes sample whole-class lessons, additional investigations for whole-class lessons, and independent investigations. I’ve also written About the Mathematics sections that offer commentary about some of the problem-solving investigations and address the underlying mathematics.

Part 3

Part 3, “Teaching Arithmetic,” focuses on the cornerstone of elementary math teaching. Here I draw on the issues in Part 1 and embrace the problem-solving instruction emphasized in Part 2 to offer classroom teaching suggestions for developing students’ arithmetic understanding and skills. The nine sections span the content from beginning number concepts through decimals and percents. In each section, suggestions are included for whole-class instruction, partner or small group experiences, and assessing students’ understanding.
Part 4
Part 4, “Questions Teachers Ask” is a compilation of questions from teachers and responses I’ve provided over the years.

Reproducibles
More than forty reproducibles have been created to help you prepare lessons.

Getting Started
About Teaching Mathematics, Fourth Edition, offers more than 250 mathematical investigations and teaching suggestions. I realize that this is a huge resource to add to your professional library. I don’t expect, or advise, that you feel the need to read the resource from beginning to end. Rather, scan the issues in Part 1, the content areas in Part 2, and the specific areas of arithmetic in Part 3, and dig in to an area that best meets your needs.