

Introduction

Teaching middle school mathematics is a complex endeavor. Adolescents experience significant intellectual, physical, emotional, and social changes. In addition, today's diverse student bodies necessitate that you connect and build relationships with students whose ethnicity, beliefs, and socioeconomic status may differ from your own. The middle school math teacher is thus presented with particular challenges. This book is meant to address those challenges and help give you support as you work to create a safe, encouraging, and equitable classroom; as you aim to be responsive to the needs of both advanced and struggling students; and as you strive to be a thoughtful and effective math teacher.

Whether you're right out of college, have been teaching for a few years, or have been in the classroom for most of your career, you probably have questions about the math that is appropriate for middle schoolers as well as how to effectively teach it. Questions like the following:

- *What do I need to include when considering my instruction for the year?*
- *How do I set up a learning environment in which students are willing to take risks?*
- *Sometimes when students work together, one or two individuals do most of the work while the other members goof off. What are ways to ensure individual accountability when my students are working with a partner or group?*
- *I have a number of students who are just learning English, and they struggle with the writing I assign in math class. How can I best support them?*
- *What are some effective ways to connect with parents of adolescents?*
- *I know that my less-experienced learners will benefit from using manipulative materials, but do my most-experienced learners really need them?*
- *What are the benefits of using calculators and computers in math class?*

This book addresses these questions and many more. No matter your interests, prior experiences, or particular dilemmas, there is plenty of help here for anyone who wants to be successful teaching mathematics to adolescents.

Adolescents' Intellectual Needs

As children grow into adolescence, they think more abstractly. The process doesn't take place at the same time for each child, especially when you consider that students' understanding is influenced by their opportunities. For the teacher trying to provide responsive math instruction, this uneven transition raises challenging issues. Topics that involve proportional reasoning, for example—including the concepts of ratio, slope, similarity, scaling, linear equations, percents, probability, interest, and rates—can be difficult even for the most adept students. Classrooms include students with a wide range of abilities and experiences, and middle school math teachers are faced with the issue of effectively meeting many different needs. In addressing skill disparities among their students, middle school math instructors regularly deal with the following concerns:

- *Some of my students really struggle with math. What are some ways to make sure that I meet their needs?*
- *How do I address the needs of students who finish assignments quickly and who are ready to tackle more complex work?*

Adolescents' Social and Emotional Needs

Adolescents have pronounced social and emotional needs. Middle school students have obvious differences in their levels of maturity, and their behavior reflects these differences, which has earned them a reputation for being difficult to teach. “Scattered,” “disrespectful,” and “self-absorbed” are several of the ways I've heard sixth-, seventh-, and eighth-grade students described—I was actually asked once how I got “stuck” teaching middle schoolers. In my opinion, however, adolescents' negative reputation is undeserved. My experience tells me that students in middle school are interesting, compassionate, respectful, fun loving, and eager to learn. Are they sometimes trying and exasperating? Of course. Teachers who bring patience, understanding, and skill to their practice will find teaching mathematics to adolescents a joyful and rewarding experience. To get the best from students, teachers will want to consider questions like these:

- *How can I support students in working together productively?*
- *Students who make mistakes during class discussions are sometimes laughed at or taunted. How can I prevent this from happening?*

- *Students' contributions are sometimes dismissed or marginalized by others in their small group who are perceived as being "smarter" or more popular. How can I address this?*
- *How do I establish a classroom atmosphere in which class discussion is valued? How do I help students learn respectful norms for interaction during discussions?*

My Journey

While I now find it immensely satisfying to teach mathematics to middle school students, this wasn't always the case. I started my career teaching young children and gradually moved up the grades. I loved teaching elementary students, but I found it difficult to do justice to all the curricular areas for which I was responsible. I felt like a jack-of-all-trades and a master of none. It was the desire to specialize in mathematics education, more than a compelling interest in adolescents, that propelled me to enter the world of middle school math teaching. I found it a fascinating place.

That first year in middle school was an eye-opener. I was impressed with the sophisticated thinking my students exhibited as compared with my elementary students, as much as I appreciated the fact that they had not yet quite outgrown childhood. One moment they'd be writing algebraic rules for working on a coordinate grid and the next they'd be asking me if they could play *Musical Chairs*. I found myself going to my colleagues' classrooms during lunch and after school to mull over all sorts of issues. We discussed the roles of discussion and writing in math class; we debated about how to tell from their work what students knew and understood and what the implications were for our instruction; we shared tools for assuring that all students—regardless of their socioeconomic status, cultural background, language, personality, and achievement levels—enjoyed equitable participation in small groups and were accountable for success in learning mathematics; we talked about efficient ways to read and score student papers. Many of the following questions emerged during the course of our regular discussions:

- *How often should students use manipulative materials? Should they be used daily?*
- *How can I help my students become more proficient with their basic facts so they don't always grab a calculator to compute problems they should be able to figure mentally?*
- *Should I grade or score every assignment?*
- *How should I prepare students for the tests that the district or state requires?*
- *What if parents tell me that they don't understand the math behind their child's classwork or homework?*
- *Getting students to complete their math homework is difficult. What are ways to encourage students to complete assignments?*
- *What ingredients are necessary to support adolescents' writing in math class?*

In taking on these and other questions in this book, my intention is to stir your thinking about the decisions you make as a teacher and, as a result, to promote the mathematical learning of all of your students. I hope to give you support, encouragement, and direction—as well as lots of food for thought.

How to Use This Book

I recommend that you reflect on what I've written to consider how it might impact your mathematics teaching. Whether you disagree with an idea or suggestion or find yourself in favor of a particular pedagogical position, examining and questioning why you have a specific response will help to make some of your assumptions, values, and beliefs visible, allowing you to reflect on them, weigh various points of view, and enhance your professional growth.

I also suggest that you discuss the ideas in this book with your colleagues. You might consider beginning a faculty book-study group in order to carve out time and space to collaboratively reflect on your teaching practice. Participating in a professional learning community with one's peers is associated with increased student learning and achievement. It's worth your time and effort to meet regularly with other math teachers in your school and district.

A Final Word

All decisions about teaching have benefits and limitations, as do the answers in this book. My recommendations and suggestions are based on many years of experience teaching middle school mathematics, facilitating professional development for teachers, working with individual teachers and math teams in schools, and thinking deeply with my colleagues about how to provide an equitable education for all students. But you'll need to take your specific teaching reality into consideration as you decide what to embrace and what to fine-tune so that it fits for you. My hope is that you are able to use what I've learned to support your continually developing expertise and effectiveness as a middle school mathematics teacher.