Foreword

The publication of *Common Core Mathematics in a PLC at Work*™ could not be more timely as educators across the United States are gearing up to make the new standards the foundation of their mathematics curriculum, instruction, assessment, intervention, and professional development processes. The series editor and his team of authors are not only some of the United States' most highly regarded experts in the field of mathematics, but they also have a deep understanding of the steps educators must take to bring these standards to life in our classrooms. They recognize that if students are going to learn these rigorous skills, concepts, and ways of thinking that are essential to their success, then the educators serving those students must no longer work in traditional isolated classrooms but rather work as members of collaborative teams in schools and districts that function as professional learning communities (PLCs). As the authors state on page 12:

> It is one thing to be handed a set of written standards—even if the standards are clear, concise, coherent, focused, and individually understood. It is quite another to ensure that everyone on your team has a shared understanding of what those standards mean and what student demonstrations of that understanding, fluency, or proficiency look like.

Picture an elementary teacher working in a traditional school. He or she will likely be provided a copy of the Common Core document, may receive a few hours of training from someone in the district, and then essentially will be left to work in isolation for the rest of the year to interpret, teach, and assess each standard to the best of his or her ability. The degree to which the students assigned to that traditional classroom learn each standard will almost exclusively depend on that teacher's understanding of each standard and how much time and energy he or she is able and willing to devote to teaching the new standards.

Now imagine a team of teachers working in a school that embraces the PLC process. Each teacher will be provided a copy of the Common Core document and will become a student of the standards with his or her collaborative teammates. Teams will be provided time and support to study and discuss each standard in order to clarify, sequence, pace, and assess the standards in a common way across each grade level. Each team will be provided time to collaborate vertically with teams in the grade levels above and below its own to build a strong scope and sequence and a common language for mathematics as students progress from one grade to the next. Leadership at the school and district levels will not only provide each team with the necessary time, support, and ongoing training to engage in this critical collaborative work, but it will also put structures in place and empower staffs to build schoolwide systems of intervention, extension, and enrichment for students—providing time and support for each student to take his or her own learning to the next level.

I am honored to write the foreword for this book, written and edited by dear friends and respected colleagues. I am confident it will provide you, my heroes working in schools and districts each day, with information, strategies, tools, and resources to help you bring the Common Core for mathematics to life for the students entrusted to you each day.

—Rebecca DuFour

Introduction

> *These Standards are not intended to be new names for old ways of doing business. They are a call to take the next step. It is time for states to work together to build on lessons learned from two decades of standards based reforms. It is time to recognize that standards are not just promises to our children, but promises we intend to keep.*
>
> —National Governors Association Center for Best Practices & Council of Chief State School Officers

One of the greatest concerns for mathematics instruction, and instruction in general in most school districts, is that it is too inconsistent from classroom to classroom, school to school, and district to district (Morris & Hiebert, 2011). How much mathematics a kindergarten, first-, or second-grade student in the United States learns, and how deeply he or she learns it, is largely determined by the school the student attends and, even more significantly, the teacher to whom the student is randomly (usually) assigned within that school. The inconsistencies teachers develop in their professional development practice—often random and in isolation from other teachers—create great inequities in students' mathematics instructional and assessment learning experiences that ultimately and significantly contribute to the year-by-year achievement gap (Ferrini-Mundy, Graham, Johnson, & Mills, 1998). This issue is especially true in a vertically connected curriculum like mathematics.

The hope and promise of *Common Core Mathematics in a PLC at Work, Grades K–2* is to provide the guidance and teacher focus needed to work outside of existing paradigms regarding mathematics teaching and learning. The resources in this book will enable you to focus your time and energy on issues and actions that will lead to addressing well the Common Core State Standards (CCSS) for mathematics challenge: *All students successfully learning rigorous standards for college or career-preparatory mathematics.*

Most of what you will read and use in this book, as well as this series, has been part of the national discussion on mathematics reform and improvement since the National Council of Teachers of Mathematics (NCTM) release of the *Curriculum and Evaluation Standards* in 1989. In 2000, NCTM refocused the U.S. vision for K–12 mathematics teaching, learning, and assessing in *Principles and Standards for School Mathematics* (PSSM), and the National Research Council (NRC) followed by providing supportive research in the groundbreaking book *Adding It Up* (NRC, 2001). The significance of these developments for your professional development is discussed in chapters 2 and 3.

So, what would cause you, as a classroom teacher, to believe the national, state, and local responses to the CCSS for mathematics will be any different this time than previous reform efforts and recommendations? What would cause you to think that your professional learning opportunities and activities will be any different this time than those that accompanied previous changes in standards and curriculum programs?

The full implementation of the previous mathematics teaching and learning frameworks and standards was limited by the lack of a coherent vision *implementation* process at the local level. School districts and school leaders were *invited* to implement research-affirmed changes in mathematics grade-level content, instruction, and assessment, but it was not a mandate to change. In many cases, the very system of the states' previous mathematics *assessments* caused local district resistance to teaching the deeper, richer mathematics curriculum described in the CCSS. This resistance was primarily due to the number of state standards and preparation for state testing in the intermediate grades that reflected only the lower cognitive procedural knowledge aspects of the states' standards. In many school districts, it often felt like a race to get through the grade-level or course curriculum expectations.

Since 1989, mathematics teaching and learning in the United States has been mostly characterized by *pockets of excellence* that reflect the national recommendations for improved student learning in mathematics. The lack of coherent and sustained change toward effective practice has been partially caused by a general attempt to make only modest changes to existing practices. In this context, professional development opportunities were often limited or, in some cases, nonexistent. This situation is defined as *first-order change*—change that produces marginal disturbance to existing knowledge, skills, and practices favored by faculty and school leaders who are closest to the action.

The CCSS expectations for teaching and learning usher in a new opportunity for unprecedented *second-order change*. In contrast to first-order change, second-order change requires working outside the existing system by embracing new paradigms for how you think and practice (Waters, Marzano, & McNulty, 2003).

Although prekindergarten standards are not addressed in the CCSS for mathematics, that does not imply mathematics is not important for preK students. In general, prekindergarten childcare and early education services are funded and regulated by agencies outside state and district institutions, and are not subject to standards mandates. Thus, preK standards are not part of the CCSS. However, the significance of mathematics instruction for young children is highlighted in other standards documents that preceded CCSS. *Curriculum Focal Points for Prekindergarten Through Grade 8 Mathematics* (NCTM, 2006) served an important function in enabling schools and districts to improve mathematics curriculum and instruction beginning with prekindergarten. Similarly, the National Association for the Education of Young Children (NAEYC) affirms the importance of high-quality mathematics education for three- to six-year-old children in *Early Childhood Mathematics: Promoting Good Beginnings* (NAEYC, 2010). NAEYC acknowledges that young children in childcare or other early childhood

education settings can have significant experiences with mathematics. Research on children's learning in first six years of life indicates that these experiences can have long-lasting outcomes (Bowman, Donovan, & Burns, 2001; Shonkoff, & Phillips, 2000). The emphasis on early learning has prompted several states to create their own preK standards as part of the 15 percent of additional mathematics that states may add to the CCSS. Examples of preK standards from two states—New York and Maryland—are provided in appendix A (page 153), and this book does address some insight into preK standards issues and questions in chapter 3.

However, this book, *Common Core Mathematics in a PLC at Work, Grades K–2* is designed to help K–2 teachers and teacher leaders collaboratively build a sound mathematical foundation for their students. The five chapters focus on fundamental areas required to prepare every student and teacher for the successful implementation of CCSS for mathematics leading to the general improvement of teaching and learning for all students. These areas provide the framework within which second-order change can be successfully achieved. The five critical areas are the following.

1. **Collaboration:** The CCSS require a shift in the *grain size of change* beyond the individual isolated teacher or leader. It is the grade-level or course-based collaborative learning team (collaborative team), within a Professional Learning Community (PLC) at Work culture that will develop the expanded teacher knowledge capacity necessary to bring coherence to the implementation of the CCSS. The grain size of change now lies within the power and voice of the collaborative team in a PLC.
2. **Instruction:** The CCSS require a shift to daily lesson designs that include plans for student Mathematical Practices that focus on the process of learning and developing deep student understanding of the standards. This change requires teaching for procedural fluency *and* student understanding of the grade-level CCSS content. One should not exist at the expense of the other. This will require your collaborative team commitment to the use of student-engaged learning around common high-cognitive-demand mathematical tasks used in every classroom.
3. **Content:** The CCSS require a shift to *less* (fewer standards) is *more* (deeper rigor with understanding) at each grade level. This will require new levels of knowledge and skill development for every teacher of mathematics to understand *what* the CCSS expect students to learn at each grade level or in each course blended with *how* they expect students to learn it. What are the mathematical knowledge, skills, understandings, and dispositions that should be the result of each unit of mathematics instruction? A school and mathematics program committed to helping all students learn ensures great clarity and low teacher-to-teacher variance on the questions, What should students learn? How should they learn it?
4. **Assessment:** The CCSS require a shift to assessments that are a *means* within the teaching-assessing-learning cycle and not used as an *end* to that cycle. These

assessments reflect the rigor of the standards and model the expectations for and benefits of formative assessment practices around all forms of assessment, including traditional instruments such as tests and quizzes. *How will you know* if your students are prepared for the more rigorous state assessment consortia expectations from the Partnership for Assessment of Readiness for College and Careers (PARCC) and the SMARTER Balanced Assessment Consortium (SBAC)?

5. **Intervention:** The CCSS require a shift in the team and school response to intervention (RTI). Much like the CCSS vision for teaching and learning, RTI can no longer be invitational. That is, the response to intervention becomes R²TI—a required response to intervention. Stakeholder implementation of RTI programs include a process that *requires* students to participate and attend. How will you *respond* and act on evidence (or lack of evidence) of student learning?

Second-order change is never easy. It will require your willingness to break away (or to help a fellow teacher break away) from the past practice of teaching one-standard-a-day mathematics lessons with low cognitive demand. This change will require teachers to break away from a past practice that provided few student opportunities for exploring, understanding, and actively engaging, and one that used assessment instruments that may or may not have honored a fidelity to accurate and timely formative feedback. Now every teacher will be required to embrace these new paradigms to meet the expectations of the CCSS in grades K–2.

Based on a solid foundation in mathematics education research, *Common Core Mathematics in a PLC at Work, Grades K–2* is designed to support teachers and all those involved in delivering meaningful mathematics instruction and assessment within these five areas of second-order change. It is our hope that the suggestions in these chapters will focus your work on actions that really matter—for you and your students.

Above all, as you do your work *together* and strive to achieve a PLC at Work school culture through your well-designed grade-level or vertical collaborative learning teams, your collective teacher knowledge capacity will grow and flourish. Each chapter's Extending My Understanding section provides resources and tools you can use in collaborative teams to make sense of and reflect on the chapter recommendations. Then, as a collaborative learning team, make *great decisions* about teaching, learning, assessing, and how your response to learning will impact student mathematics achievement. We hope this book will help you make those great decisions—every day.