

Preface

About this Edition

The first and second editions of *The Young Child and Mathematics* (Copley 2000, 2010) have served as resources for teachers of early childhood mathematics that expertly weaved together research-based ideas about development with practical strategies and specific examples. Our goal in this new edition is to extend these strengths to incorporate the latest advances in research and professional development. There already exist numerous wonderful resources about children's mathematical thinking, including *Young Children's Mathematics* (Carpenter et al. 2017), *Learning and Teaching Early Math* (Clements & Sarama 2021), and *Preparing Early Childhood Educators to Teach Math* (Ginsburg, Hyson, & Woods 2014). This book does not seek to replicate those resources; instead, we will bring together the most important ideas about children's mathematical thinking and extend beyond these resources to help teachers not just to *know about* children's thinking but to *use* children's thinking to guide their day-to-day practice.

Over the past decade, we have experienced in preservice and in-service settings the power of leveraging classroom vignettes to support teachers in learning about children's thinking and mathematics content—in ways that are *integrated* and *embedded within* classroom practice. This book contains detailed vignettes from early childhood programs, as if you are stepping into a classroom space where children's excitement is abuzz as their mathematical ideas are being taken up in interactions with other children and with the teacher.

The integrated and embedded approach we take in writing this book will support your learning by engaging with critical aspects of teaching—children's thinking, math content, in-the-moment instructional decision-making—in dynamic and related ways, rather than treating each as separate and isolated. An example of this is our embedded approach to assessment. Because observing children's ideas is at the core of each vignette, we highlight assessment as embedded within teachers' moment-to-moment practice as they watch and interact with children. Connecting instructional decision-making to the

development of children's mathematical thinking supports prospective and practicing teachers in understanding the details of what to listen and look for while children are engaged in mathematical activities.

The classroom vignettes and commentary throughout the chapters put children's voices and actions at the center of teaching and learning and showcase responses from teachers that validate and build on children's ideas. This embodies a stance on teaching mathematics that attends to issues of equity and identity: children bring a wealth of knowledge and resources with them into the classroom, and the role of the teacher is to invite children to share these resources as they build on their mathematical understandings. The attention, then, is always on *what children know* instead of what they don't know (NAEYC 2020). This reframing directly challenges prevailing deficit discourses about particular groups of children to recognize and draw from the varied cultural and linguistic resources that children bring to the classroom.

Our Theory of Learning

The writing of this book is guided by a set of important ideas about how people learn—both children and adults. Like many educators and scholars, we see learning as a fundamentally social endeavor. People learn through participating and communicating with one another, in and outside of school. We make meaning through shared engagement in tasks and activities. We learn and communicate through language (spoken and written), gestures, tools, and technology. Who we are shapes how we participate with one another and how we make sense of those interactions. These experiences, in turn, shape how we see ourselves and how others see us.

Research traditions that have influenced schooling in the United States often isolate learning as something to be achieved by individuals. But the individual is only one small tile in the mosaic of learning. Learning does not happen in a vacuum; who you're with matters, the tools and shared understandings of the tools matter, the context matters. People learn as



they share a common experience that leads them to ask questions in a particular way, consider someone else's idea, and maybe build on that idea. We learn as we return to the experience—the same space, the same activity—together on a new day, with new ideas on the table and new ways to engage again.

Not only is learning a social endeavor, it is one that is shaped by broader cultural, political, and historical forces that contribute to ongoing inequality in terms of access and outcomes related to mathematics learning. How children are expected to talk in school is linked to culturally specific discourse patterns. Traditional views of knowing and doing math in school have been narrowly defined, been constrained by Western views of development, and overlooked the varied practices and ways of knowing that children bring with them into the classroom (NAEYC 2019).

This book is driven by a commitment to transform the mathematical experiences of young children. We know that narrow, entrenched notions of what counts as math and who is seen as mathematically capable have led to pervasive and dangerous deficit notions of what children “lack,” particularly historically marginalized groups of children. Our hope is that the ideas in this book can provide a vision of learning and teaching that counters these deficit perspectives, recognizes young children's mathematical brilliance,

and capitalizes on their curiosity and intuition. Together, we can create classrooms where children's ideas and contributions are the driving force of the math, where children are active agents of their own learning, and where children see themselves and their ideas reflected in the math we do in school.

Many examples throughout this book focus on the nuance of interpersonal interactions among early childhood educators and children in preschool and kindergarten settings, specifically those connected to the details of children's thinking. Our focus on interactions around children's thinking is grounded in both research evidence and our personal experience. We highlight the critical role of the teacher in crafting meaningful learning experiences for the child. Such experiences leverage the child's individual strengths, unique set of cultural and linguistic resources, history, and ways of participating. Our partnerships with teachers across many settings have confirmed that such a focus is productive (for different teachers at different points in their career trajectories), meaningful (by honoring the varied resources that teachers and children bring to each context), and generative (to support ongoing collaboration and lifelong learning).

The following are the principled ideas that underlie our stance on teaching and learning early math:

- › Young children, no matter their age or background, bring with them diverse cultural and linguistic resources and robust mathematical understandings to learning situations.
- › The role of early childhood educators is to build on children’s intuitive ideas about math, drawing on the resources that children bring as productive learning supports. This can occur in powerful ways across a range of informal and formal spaces in playful, intentional, and developmentally appropriate ways.
- › Research documents the development of children’s mathematical understandings in early childhood. Attending to the details of children’s thinking through the lens of research-based principles supports teachers in recognizing what children understand and making instructional decisions that build from what children know and can do.
- › Mathematics identities are socially constructed in ways that privilege and marginalize groups of individuals differently; challenging the status quo of who gets positioned as “good at math” is critical to disrupting inequities.
- › Deep mathematical learning occurs through multiple modes of communication—spoken language, gesture, movement, tools, and written representation together play an important role in supporting mathematical development for all children, especially dual language learners.

- › Early childhood educators are professionals with vast experience and knowledge about supporting the development of young children. As lifelong learners, they should be supported to try new things, take risks, innovate, and reflect as these processes are critical to long-term learning that is generative.

This set of ideas is not a static collection of words but rather an artifact for engagement designed to exist dynamically as it is read, discussed, taken up, challenged, and adapted by those who see themselves as influential in the lives of children.

Ultimately, our hope is that this book disrupts the narrow ways that individuals have been expected to participate and succeed in mathematics, which have historically produced negative math experiences for children and early childhood educators alike. Our Instructional Activities are intentionally designed learning spaces that reframe mathematical engagement in a manner that is joyful, invite children’s participation with a range of mathematical understandings, and support children to make mathematical connections inside and outside the classroom. The vignettes illustrating the Instructional Activities and beyond help teachers reimagine their roles from that of tellers of information to elicitors of children’s thinking who nurture the development of positive mathematics identities.