

# INTRODUCTION

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One of the things we love about early childhood and elementary spaces is the natural curiosity young children bring with them, including connections they build between school and their lives outside of school, the wonderings about their world they bring into conversation, and their sense and inclination for problem solving and exploration. Teachers bring their lives into the classrooms as well; their beliefs, values, and ways of learning and knowing are all reflected in curriculum, instructional design, implementation, and assessment of children. Teachers' desire to build on this knowledge and expertise in lessons can be stifled based on calls to use prepackaged materials, rigid timeframes for teaching (both during the day and throughout the year), and limited time to plan and collaborate around integrated lessons or units. Yet teachers push forward, mindful of what they know to be best for the groups of the young children in their care.

We know that when teachers can draw from the lives and interests of children, families, and communities, meaningful teaching and learning happens. This kind of work is rooted in contexts that are familiar, personal, and connected to the things that children in the classroom are experts in. This is an idea we share with teachers we collaborate with, preservice teachers we mentor, and policy makers we aim to inform. This work is hard; it takes time, persistence, and creativity. But it is also worthwhile and can mean the difference for children and grownups developing a passion for mathematics.

Our hope is that as you are reading and engaging with this book, you think of your own beliefs about teaching, the children in your classroom, and their ways of interacting with the world. We believe that you will experience several benefits:

- Acknowledge all children in your classroom as capable mathematics learners and social justice advocates, seeing their experiences and wonderings as opportunities to contribute their voice and agency with their communities.
- Recognize the ways in which you are already on this journey of teaching mathematics for social justice in your classroom and in your professional development, and identify ways to enhance what you are already doing.
- Know that you are not alone in this work and that there are other early childhood educators who exist to partner with, to share ideas with, or to lend support.

## WHY IS TEACHING MATHEMATICS FOR SOCIAL JUSTICE CRITICAL?

As noted by Koestler (2012),

*No content area, including mathematics, is neutral, and therefore teaching [mathematics] is not neutral. The topics teachers include (or do not include), the activities they ask students to do, and the forms of participation they demand, all send messages to students about what is important, valid, and valued in mathematics and in school. This lack of neutrality is true both with respect to what teachers value within mathematics—they can either emphasize memorization or they can emphasize learning with understanding through guided investigation—and with respect to the ways in which they present the role of mathematics in the world—they can emphasize oft-used contexts in elementary school such as apples, puppy dogs, and ice cream, or they can include problems that use mathematics to understand and analyze pressing issues such as environmental problems or democratic participation. (p. 84)*

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Early childhood mathematics classrooms are ripe as a space for teaching mathematics for social justice because young children are interested in exploring topics related to fairness, equity, and justice. Using mathematics to do this supports children in using problem solving and problem posing skills in ways that help them understand their world, including social justice issues they encounter, and position them as active participants and agents in making their classrooms, schools, and communities more equitable and just places.

For decades, professional organizations like the National Council of Teachers of Mathematics (NCTM) have called for mathematics education to engage children in problem solving that involves real-life applications (e.g., see NCTM, 1989, 2000). More recently, there have been calls for teachers to support children in using mathematics as a tool in critical ways (e.g., Association of Mathematics Teacher Educators [AMTE], 2020; NCTM, 2020; NSCM & TODOS, 2016). Too often children get the message that mathematics is disconnected from their lives and are tasked with solving “fakey” problem after problem. Social justice mathematics is specifically connected to real-world cultural, social, and political issues that are related to learners’ home, school, and community lives and to our broader society. We define teaching mathematics for social justice as engaging learners in using mathematics as a tool to understand life, power, and societal issues (Gonzalez, 2009).

In the early years, we envision teaching mathematics for social justice as children exploring characteristics of their lives, including their families, schools, and communities, and the ways in which mathematics can be used to engage with equity issues such as power, participation, and access. During the later years, teaching mathematics for social justice can help foster informed citizens who are empowered to identify and solve real-world problems. Children can see how mathematics

can connect to their cultures and communities, both historically and in the present day. They can also begin to make sense of how mathematics can be used as a tool for social change in extensions that reach beyond the classroom setting. Besides being connected to our lives, we see other important aspects of this work. We argue that teaching mathematics for social justice is critical for four reasons:

1. It builds mathematical literacy.
2. It supports children to learn to use mathematics as a tool for social change.
3. It empowers children as agents of change.
4. It rehumanizes mathematics education.

## THIS BOOK'S AUTHORSHIP

As former teachers, now teacher educators, part of our hearts will always be in the classroom. This identity permeates our work and our attempt to cultivate resources, curriculum, and stories that resonate with classroom teachers. Our role as mathematics teacher educators often takes us into schools and classrooms where we see children and teachers learning from one another and experiencing the joy and beauty that comes from mathematics. At other moments, we are in university classrooms, working with future teachers to think about the mathematics experiences they had as young learners. We also ask the future teachers with whom we work to consider how they might work to plan for and implement lessons to connect mathematics and social justice, recognizing for many of them this idea is new. We first offer them opportunities to engage in experiences that use mathematics to make sense of and critique injustices in our world.

We see the importance of having hard conversations with young children and encouraging them to “mathematize” their world. We want young children to continuously engage with mathematics that connects to the ways in which they, and their families, use mathematics outside of the school setting. We want them to see mathematics as a tool to make sense of the events and happenings close to them, using mathematics as a tool to critique their world and advocate for change when needed. We view children as an asset to our society, capable of great things. They push us to consider new ideas and to see the world from a different perspective. Their voices are powerful and deserve to be heard in spaces where adults are making decisions.

### Lesson Authors

Our lesson author team is composed of early childhood teachers, early childhood teacher educators, mathematics teacher educators, undergraduate and graduate students, and children themselves. They live in various kinds of communities across the United States and have written lessons that support understandings of different kinds of topics and connect to different mathematics domains. Within each lesson, you will find out more about the lesson authors.

## WHO IS THIS BOOK FOR?

This book welcomes those who are new to teaching mathematics for social justice and those who have been engaged in this work for some time. We envision early childhood educators (PreK–2), classroom support personnel, mathematics coaches, center directors, school and district leaders, and mathematics teacher educators to use this book as an entry point into thinking about teaching mathematics for social justice, as a wealth of ideas to modify for their classroom context, as inspiration for lesson design, and as confirmation that they are not alone in doing this critical work in the early years. Those outside of the PreK–2 grade band may find the lessons and guiding principles as important in their thinking about what precursory experiences children may come to their classrooms with, or as eye-opening highlights of the capabilities that young children bring with them to the classroom setting. Administrators may find reflection and lessons learned powerful as ways to provide conceptualizing support for teachers who are on this journey and needing a supportive community (whether on their teaching team, or when facing stakeholder pushback).

## THE BOOK'S ORGANIZATION

This book is organized into three parts. Part I (Chapters 1–4) will lay the groundwork for teaching mathematics for social justice and what that means in early childhood and early elementary settings. In Chapter 1, we share our ideas of what we mean when we talk about teaching mathematics for social justice in early childhood settings, including ways in which these ideas are taken up in connection with the Social Justice Standards from Learning for Justice (formerly known as Teaching Tolerance). Chapter 2 illuminates ways to foster a classroom community that emphasizes social justice, for those who are new to this work to those who are looking to enhance the practices and pedagogies they are already using. Chapter 3 aims to provide insight into instructional approaches that you may already be using in your context and how they are connected to teaching mathematics for social justice. Chapter 4 transitions into thinking about how to design lessons that center both mathematics and social justice goals, before concluding with some reflection questions to prepare you for lesson planning and implementation.

Part II (Chapter 5) will feature lessons from our lesson authors. We wanted to create a book that could center the uniqueness of the early childhood–early elementary setting and the complexities that accompany being mathematics and social justice educators in an early childhood context. Because of this, there will be some lessons that span shorter amounts of time and others will take multiple days. Some lessons make connections to rich units of study or inquiries that center the children's own experiences. Lesson authors were encouraged to think about making connections to multiple subject areas and modalities of representing learning, a feature of early childhood classroom settings we dearly love. We invite you to look beyond those lessons that make connections to the grade level you are teaching

and think about ways in which you might make modifications to the mathematics content for your grade level. We are confident every lesson we have included can be adapted up and down the PreK to Grade 2 spectrum, foregrounding a variety of appropriate mathematical ideas.

Part III (Chapters 6 and 7) concludes our book. Chapter 6 highlights some of the reflections and lessons learned from both our book and lesson author teams. We close with continued opportunities for reflection, growth, and development of your own lessons.

If you are like us, you might not read this book straight through from cover to cover. It might make sense to read the introductory chapters (Chapters 1–4), but then skip around Chapter 5 for lessons and topics that speak to you and may be most relevant to the children in your classroom. While we provide these lessons as templates to use in your classroom, as with any curricular resource, we assume that you will have to think through them and make minor (and maybe major) changes to meet the needs, interests, and backgrounds of the children in your classroom.

We hope that the resources in this book will help you create and focus energy on authentic experiences for children while also generating mathematical analysis or modeling to explore and take action upon issues of injustice to children's lives. We commend you for bringing your children's curiosities and concerns about their lives into your mathematics classroom. We hope that the lessons in this book help you to foster child-to-child interactions that move beyond the mathematics to be learned and into actionable change in children's lives and society.