

# INTRODUCTION

---

Teachers often feel that the mathematics courses and standards mandated by their state restrict them or force them to compartmentalize the mathematics content, disconnecting topics from real and personally meaningful contexts. We meet many teachers who report feeling stuck in a rut, moving from one topic to the next, losing these opportunities for meaningful connections by following curriculum pathways outlined by textbook chapters or course progressions that are mandated by district policy. Does this sound familiar? Has this ever been you? Unfortunately, students feel the results of this as well, often trudging through mathematics with this same sense of disconnection and tedium, wondering when they'll ever use it in their lives. There is a missed opportunity for students to embrace how mathematics can be used for self- and community empowerment.

The focus on standards and progressions often makes teachers begin to feel discouraged about their actual impact on students. Furthermore, teachers' professionalism is gradually being diminished by policies that force them to feel like factory workers on an assembly line, teaching sets of students each year without regard to who they are and being unable to embrace students' identity, culture, interests, or experiences. The latest educational program turns into the next year's car model. In essence, teachers often question what students are actually learning in their classroom.

Unfortunately, the response is focused only on what mathematics must be learned for next year's course. While there is value in grounding the work in mathematics standards, how might standards be leveraged to create a more meaningful experience for students? By the time you finish reading and implementing ideas from this book, it is our hope that you will experience several benefits:

- Your students will see how mathematics applies to their lives, and they will become empowered to use it to change the issues that affect them the most.
- You will enhance your ability to facilitate discourse around difficult topics by incorporating them into your classroom.
- Important issues for you and your community will become better integrated with your teaching life each day, and in turn you will feel a deeper sense of urgency—and a deeper sense of satisfaction—for effective teaching of mathematics and empowering students.
- Social disparities in your school, community, city, region, and state will begin to see improvement through grassroots efforts led by your own students. Your students will become more engaged in city, state, regional, and community grassroots efforts to address social disparities.

**An important aspect of our responsibility as educators is to help empower our students to be agents of change in their communities, states, nations, and world.**

This book offers a collection of mathematics lessons—tied to the Mathematics Essential Concepts (NCTM, 2018) we must teach—and is grounded in issues of social importance to both you and your students. These lessons are bookended by lots of practical advice. In the opening chapters, we will discuss our ideas of what it means to teach mathematics for social justice and strategies to effectively do so. We will close by offering some ideas for how to create your own social justice mathematics lessons as well as some wisdom and advice from other teachers who have embarked on this journey.

## **WHY IS TEACHING MATHEMATICS FOR SOCIAL JUSTICE CRITICAL?**

Whether we talk about it or not, our students regularly experience the impacts of social privilege, power, and activism every day. The students of our schools and communities are faced each day with disparities in opportunity, inflating the so-called achievement gap. They listen to actors in Hollywood, football players, speeches by public officials, blogs, media outlets, and the list could go on. They use outlets like social media to express themselves, share their perspectives, and highlight their social positions—a modern format of youth participatory politics (Kahne, Middaugh, & Allen, 2015). Our students have concerns about their world, their community, and their family. Should we allow or encourage our students to just “let it go”? An important aspect of our responsibility as educators is to help empower our students to be agents of change in their communities, states, nations, and world.

We would like to go further than simply stating the importance of connecting mathematics teaching and learning to teachers’ and students’ lived experiences and interests; we argue that teaching mathematics for social justice (TMSJ) is critical for four reasons:

- It builds an informed society.
- It connects mathematics with students’ cultural and community histories.
- It empowers students to confront and solve real-world challenges they face.
- It helps students learn to use mathematics as a tool for social change.

TMSJ can and should extend mathematics beyond the classroom. It can and should encourage students to learn important mathematics, build positive mathematical identities, and develop concern for the happiness of other human beings and life forms.

## **THIS BOOK’S AUTHORSHIP**

This book came about in an unusual way, with significant contributions from more than thirty people. It began when we—the four lead authors—connected over our mutual interest in providing high school mathematics teachers with a collection of lessons that addresses both the essential mathematical concepts and

issues of social concerns and injustices. We had heard from many teachers who recognized that students were significantly more engaged when the context of their learning was more personally meaningful. Furthermore, we live in an era where the immediate and widespread access to photos and videos creates opportunity for more people to have a more visceral and timely experience of social, economic, and environmental injustices. More and more of the teachers with whom we work are using these contexts in their classrooms.

However, as we discussed these shared experiences of teachers wanting a resource of lessons, we recognized that we were all cisgender male with particular privileges having emerged from similar educational and work experiences. Our perspectives represented only a sliver of the teachers and students interested in the book we imagined. Knowing that our own four sets of passions, perspectives, and lived experiences were limited, and wanting to include as diverse a range of perspectives and voices as we could manage—we also solicited lessons from mathematics educators around the country.

We wanted to invite the broader mathematics education community to submit lessons that highlighted social injustices of their own community, and concerns or issues raised by their own students. And in sharing the lessons they provided, we strove to retain their and their students' authentic voices. Therefore, most of the lessons in this book come from this diverse group of contributing authors. In addition, we sent the lessons out to reviewers, many of whom implemented the lessons in their secondary mathematics or preservice mathematics teacher classrooms. These reviewers gave extensive feedback on the book and all the lessons; their thoughtful insight challenges you to think even further outside of your experiences, biases, and assumptions, and to consider a broader representation of students and teacher experiences.

We value the voice of each educator who contributed a lesson, and we have made all attempts to share their work and their voice with you. Outside the major required elements for the lesson submissions, we asked lesson writers to format and submit lessons based on how they had implemented them in their classrooms. We then edited lessons for clarity, mathematical rigor, and cohesion in order to highlight the voice and authenticity of work in the field. Their lessons have been tested and refined, in their own classrooms and in others. We are grateful to them and all those who helped develop this book.

As a team, we each have our own motivations and understandings of teaching mathematics for social justice. Here, each lead author briefly describes what brought him to focus his career on equity and justice issues in mathematics education.

### **Robert Q. Berry III**

*As with all research, race, culture, and life experiences impact the positionality we bring to our work. As a Black man who taught middle school mathematics in an urban setting, I was an advocate for children, particularly minoritized children. As a learner of school mathematics, I experienced similar factors to those that I research. For me, the roles of researcher, learner, and teacher are intertwined and complementary. I cannot discount the fact that my race, gender, social class, and political views affect the work in which I engage. Rather than minimize this influence, I use my multiple identities as an interactional quality in my work. I bring a lens of social justice and equity to much of the work in which I engage.*

*Equity issues in mathematics education are central to my work with four key strands: (a) understanding Black children's (particularly Black boys') mathematics experiences and identities; (b) examining standards-based mathematics teaching practices from an equity lens; (c) unpacking equitable mathematics teaching and learning; and (d) exploring interactions between technology and mathematics education.*

*My teaching and research focused on Black boys has been a consistent theme throughout my work for more than 30 years. I have learned from this work that identities play a significant role in Black boys' perceptions of achievement, participation, and other Black boys. The construction of racial and mathematics identities from the perspectives of the Black boys has implications for how these boys engage in mathematics and for teaching practices. With this in mind, I worked with Albemarle County Public Schools (VA) and 100 Black men of central Virginia to develop a mathematics and mentorship program for Black boys in Grades 5 through 8 called Math, Men, & Mission (M-Cubed). The promises and challenges of such partnerships centralize issues of social justice and mathematics.*

*I have collaborated with researchers, teachers, learners, parents, and community members, affording me perspectives on the issues facing mathematics teaching and learning across diverse contexts. My work in mathematics education, focused on issues of access, equity, and empowerment, pushes the field to consider perspectives to broaden our lens on what it means to do and understand mathematics. From my work, I have developed strengths working in multiple contexts, developing a framework for understanding mathematics teaching, and advocating strongly for teachers and learners.*

### **Basil M. Conway IV**

*Teaching mathematics to empower students has always been a professional passion of mine, particularly as a classroom teacher for ten years and currently as a mathematics teacher educator. My journey toward teaching mathematics for social justice (TMSJ) began when, while completing my mathematics education graduate studies, I read a series of particular Bible passages that intersected with what I was learning and inspired me. Proverbs 31: 8–9 resounded in my head as I learned about mathematics research related to access, equity, and empowerment: “Speak up for those who cannot speak for themselves, for the rights of all who are destitute. Speak*

*up and judge fairly; defend the rights of the poor and needy.” I began to question what I was doing from a place of power in my own mathematics classroom. How was I empowering students to be agents of change in their lives and others’ lives? I received Jesus as my Lord in order to mimic and model his behavior. He repeatedly stood against the powerful, uplifting the oppressed. I have decided to focus on Jesus’ love, a love so great and so selfless that he didn’t just seek justice for others; rather, he sought injustice for himself for the sake of others.*

### **Brian R. Lawler**

*In the first years of my high school mathematics teaching career, I was fortunate to work with a team of teachers for whom the foundations of their work were issues of equity. I was engulfed in instructional, curricular, and assessment conversations that focused on each and every student’s achievement, embracing the need for more varied opportunity for each student to engage in mathematics and demonstrate their understanding. This team had eliminated tracking in mathematics in our large, suburban high school thanks to their understanding of how structures of schooling ensure inequitable outcomes. While these attitudes reflect Gutiérrez’s (2002) dominant axis of mathematics education—access and achievement—an important emphasis focused also on the students we were producing; we wanted to create students who saw themselves as authors of mathematics (Lawler, 2010, 2012).*

*The early years of my career also taught me that changes to mathematics instruction—such as detracking, group work, writing in math, use of graphing calculators—seemed to go against the grain in ways that disrupted privilege, provoking negative responses seemingly aimed at preserving the status quo. I also learned that these newly valued, egalitarian instructional aims and practices seemed to be an affront to those of us who identified as successful in mathematics; our privilege was under attack. My local experiences played out nationally in what is now known as the Math Wars (Wilson, 2003). Thirty years after the initial wave of equity-driven changes in mathematics instruction, scholars, including myself, have shifted orientations to not only continue to develop equitable mathematics instructional practices, but now also focus on the reasons behind the inability to implement to scale and sustain these research-based best practices. At the same time, social inequities are becoming both more extreme and more visible through new media.*

*Having been raised by Catholic (Jesuit) parents, activists during the Civil Rights era, my life has been attuned to critique and action against social injustice. Freire (1970/2000) gave me access to understanding the role of privilege in society and how education can be a struggle for equality and, more simply, humanity; education as the practice of freedom. Foucault (1980) provided access to new ways of thinking about how power operates, and that the construction of difference serves to perpetuate power. Gutstein (2006) contextualized Freire’s work into several elements of what for me are the foundation of teaching mathematics for social justice: preparing students to read and write the word of mathematics, and to read and write the world with mathematics.*

**In today's society, using mathematics as a tool for empowerment has become paramount to ensure that truth prevails over conviction.**

### **John W. Staley**

*My career as a mathematics teacher and leader has been driven by issues related to equity, social justice, and the need to help students value and use mathematics as a tool to address social justice issues in their lives. My teaching career began in 1987 at a juvenile correctional facility for young men between the ages of 12 and 18, where I realized that teaching mathematics meant more than teaching students the steps to find the “correct” answer(s) to problems. I quickly recognized that my calling to teach students extended beyond mathematics concepts and skills to lessons that they could use in this journey called life. From the beginning, my goal as an educator has been to develop my students’ self-confidence and belief in their ability to try, do, and reflect on things as they lived their lives, inside and outside of the mathematics classroom. Thus, lessons and learning opportunities were designed to encourage and empower students to become thinkers and doers of mathematics, connect to students’ lives and hopes for the future, help students see relevance in the mathematics they are learning, and model for students the concept and value of respect—respect for self and others.*

*I also realized that as a Black man from the city of Philadelphia, Pennsylvania, I had the opportunity and responsibility to be a positive role model and advocate for my students. This opportunity eventually extended to work with other educators and adults. I thank my mother and grandparents for teaching me at an early age that things might not always be fair, but I should always act and live life as if someone was watching and to treat others as I would want to be treated.*

Each lead author’s introduction presents a different and personal motivation and passion for TMSJ. In part, these stories describe mathematics as a tool to empower students and future citizens to become active agents of change. In today’s society, using mathematics as a tool for empowerment has become paramount to ensure that truth prevails over conviction. Reflect for a moment on what caused you to pick up this book. What story defines your personal motivations for wanting to infuse social justice into your mathematics curriculum?

Extend the array of motivations, passions, and experiences of the four lead authors to the diverse contributors to this book; this book reflects a remarkable breadth of experiences and worldviews. And in this tremendous diversity, through our collaboration, we found many common concerns about our families, neighbors, community, and country. We suspect that the variety of contexts offered in this collection of lessons will offer all teachers the opportunity to draw upon themes generative in their own context with opportunity to engage students across the readership.

## **THE CONTRIBUTORS**

As we planned for this book on mathematics and social justice, we understood such an aim could only be fully realized if it included a wide array of voices from the field and confronted issues that go beyond our four lived experiences. Following you will find a short introduction from each contributing author.





**Ayse Ozturk** is a doctoral student at The Ohio State University. As a foreign female STEM student who comes from a marginalized background, her passion is developing and teaching mathematics

lessons with the intent of empowering all students to be active, critical mathematical thinkers and reflexive participants in society.



**Travis Weiland** taught high school mathematics for five years in North Carolina. He works to reimagine how statistics is taught in schools, leveraging his privilege as a white, middle-class, cisgender male to create spaces for all students to have transformative experiences with statistical practices, interrogating their world

through quantitative, sociocultural, and spatial ways of knowing.



**Sheila Orr** taught high school mathematics in a large urban public school for eight years. Her passion is helping students use mathematics as a way to analyze and

advocate for changes to injustices they see in the world.



For more than thirty years, **Enrique Ortiz** has been involved in teaching and developing learning materials for Grades K-12 and university-level courses in Puerto Rico, Louisiana, and Florida. He grew up in Puerto Rico, and this has shaped his identity, beliefs, and

passion for teaching mathematics for social justice.



**Shakiyya Bland** taught elementary and secondary students for ten years in Japan and Kansas. As an African American female secondary learning coach, she strives to design curriculum with students to achieve educational and

racial equity. She is currently conducting doctoral research on secondary educators' use of guided inquiry to increase student engagement in mathematics. She enjoys learning about social justice from historical and contemporary voices to lead transformative systemic change in public education.



**Ginny Powell** has been a high school and college educator for twenty years. As a white woman teaching mostly Black adults, she purposefully uses contextual mathematical situations that suggest conversation about inequities, opinions, and current events, then lets that conversation happen.



**Allyson Lam** grew up in San Francisco's Chinatown and taught mathematics at Melrose High School in Memphis, Tennessee. Shaped by these communities and their rich histories of collective action, Allyson strives to equip her students to fight for social change and advocate for themselves and each other.



**Samantha Fletcher** is a third-year high school mathematics teacher in Tennessee. In graduate school, she developed a passion for serving rural STEM educators through professional development and the creation of curriculum. She works toward building connections between mathematics, leadership, and vocational skills to empower and provide equitable access to mathematics education for rural high school students.



**Lisa Poling** spent seven years working in a public school system. Through experiences in the classroom (and broader world), she began to notice that agency and advocacy were often absent in the learning context. As a teacher educator, she continually works to broaden the lens through which individuals see others in their world.



**Mary Candace Raygoza** began her work as a mathematics teacher ten years ago at a public school in East Los Angeles. As a white, cisgender woman, she strives to interrogate her privilege and understand how mathematics education perpetuates yet can intervene to challenge oppression. In her role as a teacher educator at Saint Mary's College of California, she supports preservice teachers to examine how their identities and experiences shape the transformative teachers they are in the process of becoming.



**Hilary Tanck** taught middle school for eight years in urban, suburban, and international settings. She believes her work in comparative and international education presents the possibility of bringing together people or groups from different backgrounds to engage in authentic conversations in the hope of genuine understanding.



**Andrew Reardon** is a high school mathematics teacher in Columbus, Ohio. He works to ensure students have the necessary mathematics skills to be agents of social change and strives to begin that work alongside his students. His goal is to help students realize that a sound knowledge of mathematics is essential to effect change.





**Carlos Nicolas Gomez** taught high school for five years in a rural setting. All five years he greatly enjoyed working with and advocating for students positioned in

lower-track mathematics courses. These experiences motivate his work agenda as he seeks to better prepare prospective secondary teachers in the construction of equitable learning spaces.



**Frances Harper** taught mathematics, reading, and English for nine years across Grades PK-12 in diverse urban settings in Tennessee, Massachusetts, and Kanagawa, Japan. As a white woman and first-generation college graduate, she strives to use her privilege to lift up the voices of

students who have been systematically marginalized in mathematics by trying to understand mathematics education from their perspectives.



**Stacy R. Jones** taught fifth grade for seven years and worked as a mathematics coach for three years before pursuing her doctorate. She plans to use her position as a Mexican American from a working-class family to change the narrative of who can do mathematics.



**Eric Siy** taught high school and college mathematics in the Philippines, New York, and Georgia. He currently supports teachers to teach elementary mathematics and has worked to create spaces for LGBTQ people at the

university level. As a cis Asian/Pacific Islander man, he intends to support teachers to create equitable mathematics spaces for all students.



**Stephen Lewis** taught mathematics in Grades 7-12 in urban public schools and also through an educational nonprofit organization over the course of six years. His passion for helping all learners understand how mathematics can be used to promote social change and justice drives both his teaching and his research.



**Bryan Meyer** has worked as a mathematics teacher and mathematics coach in San Diego, California. Currently, he is part of a district-wide systemic change effort to remedy the ways that structures and practices of teaching mathematics have underserved the students of Color in the community.



**Cristina Tyris** has taught middle and high school mathematics courses for four years in rural school systems. Her goal is to provide students with opportunities to experience mathematics as a tool for advocacy and a vehicle for change. Her courses encourage students to engage in discussions concerning controversial

societal issues through a mathematical lens, challenging students to become aware of implicit bias and privilege.



**Laura Gorrin** teaches high school mathematics in Berkeley, California, at the large public high school they attended. They aspire to frame mathematics in the context of struggles for social justice so that students will see mathematics as

a tool for understanding and improving their world.



**Holly Anthony** has taught Grades 6–16 in public and private middle/high schools and universities in rural regions of the southeastern United States for twenty-one years. Her commitment to supporting teachers and empowering mathematics PK–16 learners guides her

practice as an educator who believes in an equitable education for all.



**Sven A. Carlsson** taught high school for fourteen years in urban and suburban settings before transitioning to working with curriculum design for Grades 6–12 at a school in Chicago, Illinois. As a biracial Black man, he has anchored his teaching in the fight

for the educational empowerment of all students and in the view that mathematics is a tool for understanding and opposing systemic injustices.



**Rachael Eriksen Brown** taught high school mathematics for five years. Her interests are in supporting both practicing and preservice teachers (as well as undergraduate students) to include opportunities regularly for students to do mathematics

and to see themselves, their communities, and their interests in the mathematics done at school.



**Allyson Hallman-Thrasher** taught high school and middle school mathematics for four years. Her research analyzes ways to support practicing and prospective teachers in engaging all students in productive mathematics discussions and cognitively demanding tasks.



**Jessica Davidson** (left) is a graduate student at Montclair State University in New Jersey, preparing to become a mathematics educator. As a cisgender white female, she is committed to ensuring everyone has access to the privileges that too few of us have enjoyed.

**Steven Greenstein** (second to left) is an associate professor at Montclair State University. He taught high school for seven years in urban and suburban, public and private school settings. As a white, middle-class, nondisabled, cisgender male, he aims to democratize access to authentic mathematical activity that honors the diversity of learners' mathematical thinking, is nurtured by intellectual agency, and is guided by self-directed inquiry.

**Debasmita Basu** (second to right) is a doctoral student in mathematics education at Montclair State University in northern New Jersey. Before starting her doctoral studies in 2014, Debasmita was a high school mathematics teacher in India for four years. As a cisgender woman of Color, she aims to design mathematical activities that cultivate students' critical consciousness toward various social and environmental justice issues and help them realize the power and value of mathematics.

**Jules Davidson** (right) has her BS in nutrition. She is currently in the combined Master's and Dietetic Internship Program at College of Saint Elizabeth. She is a volunteer and garden manager at Father English Food Pantry in Paterson, New Jersey. Jules is focused on addressing food insecurity in marginalized populations through grassroots advocacy. She believes that healthy food should be a right, not a privilege, and works to provide vulnerable populations access to healthy foods and nutrition education.

We hope you find that the variety of contexts offered by the contributing authors in this collection of lessons will offer you the lessons you can use right away, or provide the framework for developing a personalized lesson drawing upon student-generated themes, questions, or concerns that emerge in your own context—enhancing the opportunity to engage all students.

## WHO IS THIS BOOK FOR?

This book is meant for high school mathematics teachers and mathematics teacher educators working with both preservice and in-service teachers as a means to empower students and teachers alike. We intend for this book to support you and your students to move from questions like “When/How/Where am I ever going to use this?” to questions like “What can we do about this?”

**When children learn that mathematics can be used as a tool to help them understand, explore, and investigate social situations, they are empowered to see themselves as active agents in a world of change.**

During your reading, we hope that you will grow in your understanding that mathematics may be a privileged space through which both you and your students can be empowered. Many students are not allowed the opportunity to connect mathematics with their culture and realized lives, thus your interest, reading of this text, and implementation in the classroom present an opportunity to shape students' lives and actions. When children learn that mathematics can be used as a tool to help them understand, explore, and investigate social situations, they are empowered to see themselves as active agents in a world of change. We hope that the lessons and the critical call for action contained in this book highlight how each and every student is capable of mathematical learning and can be empowered to use mathematics for change in their own and others' lives.

Though this book offers a number of suggestions for how to incorporate social justice mathematics lessons throughout the high school curriculum, it is not intended as an end-all and be-all. We hope that you use the lessons as models and starters on your journey toward creating and implementing your own social justice lessons, targeting social concerns of your own students, and helping students view themselves as mathematically empowered agents of social change.

## THE BOOK'S ORGANIZATION

This book is organized into three parts. Part I, consisting of Chapters 1–4, provides a foundation for teaching mathematics for social justice. Chapter 1 covers the landscape of basic theories of equitable mathematics teaching and teaching mathematics for social justice, laying important context for understanding the goals of TMSJ and implementing the lessons of this book. We hope it can also serve as a chapter for you to reflect on your own goals for teaching children through mathematics. Chapter 2 begins a conversation about preparing to teach for social justice in your mathematics classroom. This chapter considers the content as well as the local context in which you will implement TMSJ. It also introduces questions of how and when. Chapter 3 elaborates on some of the instructional tools alluded to in Chapter 2 that will make your lessons successful, particularly around goal setting, assessment, instruction, and discourse. Of note, we provide suggestions in this chapter on how to tread across potentially controversial topics and lead difficult discussions. Chapter 4 focuses on the design framework used for lessons in this book and the structure of the lessons themselves. It depicts a continuous cycle in which students actively investigate, understand, and reflect on challenging mathematical and social questions to empower themselves into action.

Part II of the book, Chapters 5–8, is divided by Mathematics Essential Concepts from NCTM's (2018) *Catalyzing Change in High School Mathematics*, very similar to conceptual categories in many high school mathematics standards. An important characteristic of Part II of this book and its uniqueness to the field is the mathematical depth of the lessons. Teachers who use lessons from Part II of this text attend to the mathematical rigor required in state standards while also attending to Social Justice Standards (Teaching Tolerance, 2016). We chose to organize lessons based on conceptual categories in order for teachers to easily locate lesson



ideas that may be infused with mathematical course progressions from their state, district, or school.

We believe that attention to Teaching Tolerance’s Social Justice Standards is critical in the development of high school students; thus, a cross reference of lessons to these Social Justice Standards may be found in Appendix E for teachers who are hoping to attend to all objectives identified in these Social Justice Standards across one year. In addition, each chapter in Part II is introduced with a table that highlights lesson titles, authors, and a topic of social injustice. Teachers may use these pages to find lessons that tackle certain social injustices that are relative to their demographic, environmental, or social contexts.

Part III offers two concluding chapters. First, Chapter 9 shares the reflections of some of the contributing authors, including their experiences implementing these lessons and more generally about experiences teaching mathematics for social justice. And finally, in Chapter 10, we share our recommendations for developing your own social justice mathematics lessons.

This is probably not a book to be read cover to cover, straight through. We hope that the reader gives thoughtful attention to Chapters 1 through 4. But next, we expect the reader to skim through the lessons of Chapters 5 through 8, reading those that are of most interest. Some people will be very interested to consider the thoughts and experiences from fellow teachers that are found in Chapter 9, and some will want to get into the recommendations to write their own lessons in Chapter 10. However, we imagine that both of those chapters will be read at a variety of different times—some people will want to get right to them, and others will find them most valuable after trying a few of the lessons in their classrooms.

Even if you are very eager to get right to the implementation of a lesson, we still hope you will begin with Chapter 1. Next, consider using the first lesson of Chapter 5, *The Mathematics of Transformative Resistance*. We view this lesson as an opportunity for you and your students to discuss what an experience examining questions and concerns about the world through mathematics might feel like. Then you might use Appendix E to identify a mathematical topic appropriate for your course and select a second activity to follow up with.

As you consider implementing the lessons in this book, we imagine three approaches to selecting a lesson to use. First, we expect most teachers will identify lessons that align with the content standards that are assigned to the class they are teaching. Appendix E will be helpful for this approach. However, the social justice topics, as aligned to lessons at the end of Appendix E, may be of more interest to teachers who wish to respond to an important issue that is very visible in their school community. Finally, we imagine the teacher who is interested in developing students’ knowledge, skills, and disposition toward social justice more generally, as opposed to topic- or mathematics-centered. The second chart in Appendix E aligns the lessons to the Social Justice Standards for Grades 9–12 developed by Teaching Tolerance (2016).



Many of you have been teaching mathematics for social justice and using or developing mathematics lessons of your own grounded in exploring, understanding, and responding to social injustice. You likely will be most interested in Chapters 1, 4, and 10. You can compare some of your guiding principles to ours, and possibly gain ideas on how to enhance the work you are currently doing. We believe the power of the lessons in this book is that they are models for high school mathematics teachers to imagine similar lessons that are more specific to the questions and concerns of their own students and local context, or that teachers can make minor modifications to the mathematics to align with the course they teach. We hope that these lessons stimulate ideas for the development of new, and locally meaningful, additional lessons.

We expect that the resources in this book will help you create and focus energy on authentic experiences for students while also generating mathematical analysis or modeling to probe issues of injustice relative to students' lives. We encourage you to read each of Chapters 1–4 to become familiar with the aims of the book, recommendations for TMSJ, and the framework to understand how the lessons are organized. Next, consider selecting one or two lessons to implement that align with the content standards of the course(s) you teach. We hope you will come back to the book often, each new semester, to consider additional lessons. Finally, read Chapter 9 as you are ready to begin to modify the lessons provided or begin creating your own. Chapter 10 can be read at any time, and may be most insightful after implementing one or more lessons grounded in social injustices so that you can reflect on your own experiences through the wisdom of others.

We commend you for bringing your students' curiosities and concerns about their lives into your mathematics classroom. We hope that the lessons in this book help you to foster student-to-student interactions that move beyond the mathematics to be learned and into actionable change in students' lives and society.



# TEACHING MATHEMATICS FOR SOCIAL JUSTICE

## CHAPTER

# 1

# WHAT IS SOCIAL JUSTICE, AND WHY DOES IT MATTER IN TEACHING MATHEMATICS?

Picture this: a Southern community in which high school students learned in the local newspaper about a once vibrant Black<sup>1</sup> community with businesses, churches, and community centers that had at one time served the community. The articles spotlighted people who once lived and served this community. Upon reading these stories in the local press, the high school students questioned what happened to this community and investigated how the once majority-Black neighborhood in their city had been bulldozed in the 1960s to make way for urban renewal projects. The results of this investigation led students toward unpacking not only the historical and economic impact on the Black community, but also the present-day effects such as quality schooling, jobs, access to affordable housing, and policing policies. Discussion and debate of the local news have long been essential elements of the fabric that holds communities together. Newspapers and other media outlets often present opportunities for teachers and community members to pose questions situating mathematics as a tool for understanding and investigating social injustice. Many local papers offer news and events that may not be of interest to another locality or nationally.

For the students engaged in this investigation, the intersections between history, geography, and mathematics undergirded many of their questions. Teachers designed lessons in which students used geopolitical mapping to investigate population density within their community to note the displacement of Black community members over time. That is, many Black people at one time lived in the city, but because of displacement, they were now settled in communities farther away, reducing access to jobs. With the support of community members, students also requested data from their local police on citizens who were “stopped and questioned.” Their investigation of the data suggested that Black members of the community were overrepresented in those stops by police.

---

<sup>1</sup> Through this book and the lessons included, we have intentionally capitalized terms used for people of Color, such as Black, while leaving white written in lower case. We follow Frances Harper (2019), one of the contributing authors to this book, in her rationale: “I chose to capitalize Color but not white to challenge the ways that these standard grammar conventions reinforce systems of privilege and oppression” (p. 268).

The student-led work described above led to community actions and calls for social justice. The calls consisted of petitioning community leaders for plans for affordable housing, antibias training for community leaders, and gatherings for community members to connect with and learn from one another. Most importantly, the students felt empowered to be change agents within their community by educating the broader community about what they had learned.

Being knowledgeable about the histories, cultural conditions, and contexts of communities helps teachers access student and community funds of knowledge to incorporate into their teaching. By building upon these funds of knowledge, teachers can make the most of these family and community histories as intellectual and educational resources that can support mathematics teaching and learning (González, Moll, & Amanti, 2005). Understanding the funds of knowledge in communities and families requires teachers to become active in students' communities. Thus, we must come to learn how to co-construct learning opportunities *with* communities and families. Imagine a classroom in which teachers, students, and community leaders collaborated using mathematics and other subject areas in the school to understand local issues. For example, what would it look like if these collaborations investigated food deserts in their communities, explored the allocation of public monies to fund public spaces, and studied population growth (or decline) to understand the use of community resources?

Mathematics is a tool that cultures have developed and shaped to understand, quantify, critique, and make sense of the world. Consequently, mathematics is a human activity that should cultivate in students a sense of wonder, beauty, and joy (NCTM, 2018). Furthermore, students' mathematical activity empowers them to identify, interpret, evaluate, and critique the mathematics embedded in social, scientific, commercial, and political systems. Empowered students examine the claims made in the private and public sectors, and the pronouncements of public interest (Ernest, 2010). Students can become empowered when they have access to deep, rigorous mathematics that offers opportunities to understand and use mathematics in their world. This is achieved when the mathematics they study in school integrates topics that help them investigate and understand social injustices and equity (Stinson & Wager, 2012). For example, tasks that address income distributions, sustainability, mortality rates, taxing structures, or lending practices present opportunities for empowerment and social justice.

**Students' mathematical activity empowers them to identify, interpret, evaluate, and critique the mathematics embedded in social, scientific, commercial, and political systems.**

*Until recently, embedding mathematics pedagogy within social and political contexts was not a serious consideration in mathematics education. The act of counting was viewed as a neutral exercise, unconnected to politics or society. Yet when do we ever count just for the sake of counting? Only in school do we count without a social purpose of some kind. Outside of school, mathematics is used to advance or block a particular agenda. (Tate, 2013, p. 48)*

Empowering students to use mathematics to critique and understand the world requires teachers to take a social justice position. Larnell, Bullock, and Jett (2016) remind us that, "whether inside or outside of school, mathematics is political"

Choosing not to incorporate tasks that require students to critique and understand the world is itself a political position, one of political passivity.

(p. 26; see also Gutiérrez, 2013). That is, choosing not to incorporate tasks that require students to critique and understand the world is itself a political position, one of political passivity. Conversely, choosing to incorporate those tasks is an act of empowerment. Lessons in this book seek to have students engage in the sociopolitical reality that is meaningful and important to them, and to use mathematical tools to answer questions emerging in these sociopolitical contexts that relate to their own, their classmates', and others' lives. When students have opportunities to use mathematics to solve problems in their everyday lives, they are empowered to engage in political and social acts as a way to seek justice.

## WHAT DO WE MEAN BY SOCIAL JUSTICE?

Many different communities, each with diverse perspectives, make significant contributions to society. For us as authors of this book, social justice means considering the contributions and rights of each and every person in society across four ideas: access, participation, empowerment, and human rights.

- **Access:** Ensuring access to and the fair distribution of human and material resources in society.
- **Participation:** Creating equitable opportunities for people to access information to be fully participatory in decisions that affect their and others' lives.
- **Empowerment:** Supporting people's sense of agency in taking advantage of opportunities society affords as well as working toward eliminating all forms of oppression.
- **Human Rights:** Acknowledging the rights inherent to each and every human being, regardless of race, sex, gender, nationality, ethnicity, language, religion, or any other status. Human rights include the right to life and liberty, freedom from slavery and torture, freedom of opinion and expression, the right to work and education, and many more (United Nations, 2006).

The Center for Economic and Social Justice (n.d.) situates social justice as a virtue that guides people as they institutionalize organized human interactions. Social justice instills within each person a responsibility to collaborate with others for the common good and to perfect institutions as tools for personal and social development. And while the United Nations (2006) has defined social justice as “the fair and compassionate distribution of the fruits of economic growth” (p. 7), social justice must also attend to the distribution of social and political rights. Feagin (2001b) offered such a definition for social justice:

*As I see it, social justice requires resource equity, fairness, and respect for diversity, as well as the eradication of existing forms of social oppression. Social justice entails a redistribution of resources from those who have unjustly gained them to those who justly deserve them, and it also means*



*creating and ensuring the processes of truly democratic participation in decision-making. . . . It seems clear that only a decisive redistribution of resources and decision-making power can ensure social justice and authentic democracy. (p. 5)*

These definitions of social justice require us to think about how people connect to one another, how resources get distributed, and the meaning of fairness. For us, social justice emphasizes the relations between the individual and society, and that they are to be fair and just, meaning that society has a responsibility to ensure equal rights, equal opportunity, and equal treatment for each and every individual. Living up to this responsibility means acting upon or responding to instances of injustice. This idea resonates with the joint position paper by the National Council of Supervisors of Mathematics and TODOS: Mathematics for ALL (2016), as well as the position paper of the Benjamin Banneker Association (2017), both of which argue that embracing social justice moves us beyond noticing issues and concerns about societal inequities and requires actions that confront oppression and/or marginalization—and hence, our choice to title the book *to explore, understand, and respond to social injustice*.

**Embracing social justice moves us beyond noticing issues and concerns about societal inequities and requires actions that confront oppression and/or marginalization.**

## WHAT IS TEACHING MATHEMATICS FOR SOCIAL JUSTICE?

Building on the ideas of social justice; society’s responsibility to ensure equal rights, opportunity, and treatment; and the responsibility to respond, teaching mathematics for social justice (TMSJ) is about teachers emphasizing equitable opportunities for each and every student, as well as developing an orientation toward using mathematics to enact decision-making power. This view of TMSJ builds upon four other bodies of work having to do with equitable mathematics teaching: Standards-Based Mathematics Instruction (SBMI), Complex Instruction (CI), Culturally Relevant Pedagogy (CRP), and Critical Mathematics Education (CME) (Figure 1.1).

*Figure 1.1. Equity-driven mathematics teaching frameworks—a nested relationship (Picha, 2019).*



Each of these bodies of work emphasizes important qualities of an equitable mathematics classroom, building upon the previous and adding attention to new in a sort of nested relationship. SBMI grounds the instruction in meaningful engagement with mathematics and classmates. CI can help ensure equitable engagement among students in the discourse-rich SBMI classroom. CRP reminds teachers to

draw upon cultural practices, experiences, and assets, and it challenges them to awaken students' critical consciousness. CME provides teachers with a framework to design instruction to build critical consciousness, and TMSJ provides the how. Some key ideas from each of these five nested frameworks are discussed next.

**Standards-Based Mathematics Instruction.** TMSJ must be grounded in pedagogical principles widely recognized by the profession, referred to as SBMI. These principles emphasize learning for understanding over attending only to fluency with algorithms and facts. A second point of emphasis is the recognition that understanding develops in a discourse-rich learning environment marked by conjecture, reasoning, and justification (Rubel, 2017). Paired with these ideas about what to learn and how to learn is an emphasis on the responsibility to ensure *each and every* student learns meaningful mathematics (NCTM, 1989).

**Complex Instruction.** Sociologists (Cohen & Lotan, 2014) recognized that the inequities of the larger society are replicated in small groups, systematically ensuring that some students have less access to the discourse-rich SBMI classroom, and thus fewer opportunities to learn. CI is a pedagogical theory to counteract this trend. A key feature of CI is valuing many different ways of being mathematically “smart” (Featherstone et al., 2011). In this sort of “multidimensional” mathematics classroom (Boaler, 2006), the teacher has more opportunity to raise the lowered expectations students may have for members of their group, inviting greater access to interactions for the otherwise excluded student.

**Culturally Relevant Pedagogy.** Both SBMI and CI attend to shifts in curriculum and teaching that ensure each and every student has opportunities to learn mathematics. By studying effective teachers, Ladson-Billings (1994/2009) recognized that they built upon each child's unique strengths, mathematical as well as social and cultural assets. Culturally Relevant Pedagogy (Ladson-Billings, 1995) reminds us to ensure that equitable instruction must draw upon students' cultural practices, experiences, and assets. As these cultural experiences and artifacts become central to the process of learning, students see themselves and their interests in the curriculum (Thomas & Berry, 2019). Thus, not only is academic achievement valued, but so is the growth of students' cultural competence and critical consciousness.

**Critical Mathematics Education.** CME extends the idea of critical consciousness identified by CRP. This body of work is about teaching mathematics in such a way that it attends to the concerns of fairness and social justice in the relations between the individual and the society. It centers learning as identity work (Rubel, 2017) focused on who the student is becoming. These perspectives often build upon the pedagogical practices developed by Paulo Freire (1970/2000) in the Brazilian context.

Freire described critical consciousness (his term is *conscientização*, or conscientization) as “a capacity to confront reality as transformable, and to intervene subsequently in it to effect that transformation” (Garcia, 1974, p. 15). Freire's critical education puts an emphasis on a shift in the power dynamic between student and teacher, shifting the authority for knowledge to the social context of the classroom community rather than the teacher. Students are positioned as doers, or authors

(Lawler, 2012), of mathematics. As a result, students view themselves as both “an actor and author of history” (Garcia, 1974, p. 16). Figure 1.2 captures highlights of the four equity-driven teaching frameworks that underscore TMSJ.

*Figure 1.2. Key elements of equity-driven mathematics teaching frameworks.*

Equity-Driven Mathematics Teaching Frameworks	Key Elements Contributing to TMSJ
Standards-Based Mathematics Instruction	<ul style="list-style-type: none"> <li>• Learning for understanding is emphasized over fluency with algorithms and facts.</li> <li>• Understanding develops in a discourse-rich learning environment marked by conjecture, reasoning, and justification.</li> <li>• Teachers are responsible for ensuring each and every student learns meaningful mathematics.</li> <li>• Additional resources: NCTM (2014).</li> </ul>
Complex Instruction	<ul style="list-style-type: none"> <li>• Inequities of the larger society are replicated in small-group work, creating status differences.</li> <li>• Status differences ensure that some students have less access to interaction, thus fewer opportunities to learn (Expectations States Theory).</li> <li>• The teacher can impact this by creating a multidimensional classroom, raising classmates’ expectations for contributions from each and every student.</li> <li>• Additional resources: Featherstone et al. (2011), Horn (2012).</li> </ul>
Culturally Relevant Pedagogy	<ul style="list-style-type: none"> <li>• Curriculum and instruction must draw upon students’ own cultural practices, experiences, and assets.</li> <li>• The pedagogy has three aims: academic achievement, cultural competence, and critical consciousness.</li> <li>• Additional resources: Emdin (2016), Ladson-Billings (1995).</li> </ul>
Critical Mathematics Education	<ul style="list-style-type: none"> <li>• The common teacher–student relationship reflects and reinforces inequitable power dynamics of the broader culture.</li> <li>• The banking model of education states that students are containers to receive knowledge deposits from the teacher.</li> <li>• Students understand the nature and creation of social oppression and feel empowered to intervene and seek equity.</li> <li>• Learning can emerge from a <i>problem-posing pedagogy</i>, designed around the ideas, hopes, doubts, fears, and questions that emerge in a person’s relationship with the world—what Freire refers to as “generative themes” (Garcia, 1974).</li> <li>• Additional resources: Frankenstein (1983), Freire (1970/2000), Powell (1995), Skovsmose (1995).</li> </ul>



Available for download at [resources.corwin.com/TMSJ-highschool](https://resources.corwin.com/TMSJ-highschool)

Students understand the nature and creation of social oppression and feel empowered to intervene and seek equity.

Generative themes are contexts, topics, problems, and questions students pose. They are considered generative because they contain the possibility of opening new themes, new problems and questions to be posed, and new tasks to be fulfilled.

**Teaching Mathematics for Social Justice.** Larnell et al. (2016) observed that descriptions of TMSJ are based in one of two perspectives, either TMSJ for access or TMSJ for critical consciousness. TMSJ for access is about enabling students to advance in the social order as is. TMSJ for critical consciousness is about empowering students to alter or improve the present social order (Cholson, Buenrostro, Mann, Gutstein, & Hoover, 2017). Our interpretation of TMSJ explicitly strives to achieve both, aligning with Freire’s (1970/2000) conception of a pedagogy that creates both freedom from oppression and freedom to create culture.

Following on Freire’s critical education, Gutstein (2006, 2018) argues that TMSJ must be rooted in viewing students as an important part of the solution to injustice. “Students need to be prepared through their mathematics education to investigate and critique injustice, and to challenge, in words and actions, oppressive structures and acts—that is, to ‘read and write the world’ with mathematics” (p. 4). Units of study in the TMSJ classroom are built on a *problem-posing pedagogy* (rather than a banking pedagogy in which the teacher deposits information into the student’s mind), designed around the ideas, hopes, doubts, fears, and questions that emerge in a person’s relationship with the world—what Freire refers to as generative themes (Garcia, 1974). The themes—contexts, topics, questions, and so on—are generative because they contain the possibility of opening new themes, new problems to be posed, and new tasks to be fulfilled.

Students develop and/or apply mathematics to make sense of the problems that emerge in the generative theme, so as to better understand and act upon the concern or question about the world. Thus, TMSJ has two goals: freedom from oppression through the development of mathematical literacy, and freedom to act upon and impact the world through personal and social transformation. The first is a mathematics goal, and the second, a social justice goal. Gutstein (2006) clarifies elements of these two goals, replicated in Figure 1.3.

Figure 1.3. Instructional goals when Teaching Mathematics for Social Justice (Gutstein, 2006).

Mathematics Pedagogical Goals	Social Justice Pedagogical Goals
<ul style="list-style-type: none"><li>• Reading the mathematical word</li><li>• Succeeding academically (in the traditional sense)</li><li>• Changing one’s orientation to mathematics</li></ul>	<ul style="list-style-type: none"><li>• Reading the world with mathematics</li><li>• Writing the world with mathematics</li><li>• Developing positive cultural and social identities</li></ul>

These two sets of pedagogical goals are tightly connected. While teachers aim for students to read the mathematical “word,” the traditional school content, they also want students to use mathematics to interpret and act upon the world. TMSJ also aims for students to view themselves as doers of mathematics and have a positive mathematical identity that is situated in their cultural and social identity. The connections between the two goals are where teachers can create the possibility for students to find meaning in mathematics through their exploration of, understanding of, and response to social injustice.

Through the model of the multiple teaching frameworks that contribute to TMSJ, we aim to emphasize our view that TMSJ is much more than the lessons teachers might implement in their classrooms. It is about the relationships they build with and among students; the teaching practices that help them do that; and the goals to develop positive social, cultural, and mathematics identities—as authors, actors, and doers.

## WHY SOCIAL JUSTICE IN MATHEMATICS EDUCATION?

When teachers focus only on teaching mathematics, disconnects can occur between the content and students' passions and lived realities. Contextualizing mathematics instruction in students' experiences of social injustice helps them become more interested in mathematics (Rubel, 2017). Furthermore, TMSJ supports students' use of mathematics to better understand social injustices they recognize in their lives, and to be able to act upon those injustices. In doing so, students learn more mathematics.

So why bring social injustices into the mathematics classroom? Besides offering critical issues for students to examine and serving as context for mathematics development and investigation, four other answers to this question resonate with us. Teaching mathematics for social justice helps to

- build an informed society,
- connect mathematics with students' cultural and community histories,
- empower students to confront and solve real-world challenges they face, and
- help students learn to value mathematics as a tool for social change.

Each of these rationales to TMSJ resonates with the foundations of a public education, effective instructional practices, and a purpose for mathematics education shared by mathematics teachers everywhere.

**Build an Informed Society.** To create a just society, students must become better informed about not only their own lives, but also the lives of others that may be different from their own. It is paramount that students connect to the injustices expressed by members of their school, community, city, and country—especially to injustices they may be unaware of as experienced by people with different social and cultural experiences from them. Mathematics serves a special role in informing and educating citizens of these issues. By exploring the context of important issues and relating them to mathematics, students become aware of how mathematics may be used to help them better understand the issue, possibly sorting through misconceptions and rhetoric. A student with a meaningful mathematics education is not just academically successful (*academic achievement* in CRP; Ladson-Billings & Tate, 1995), but also prepared to make informed decisions in a modern, ever-changing society.

**Connect Mathematics With Students' Cultural and Community Histories.** Too often, students experience mathematics in schools as something detached from meaningful contexts; thus, they perceive it as unfamiliar and unimportant. This leaves many of them with the sense that mathematics is inaccessible and not



connected to them or who and what they value. Students bring with them to the mathematics classroom a wealth of informal mathematical knowledge in their everyday cultural and social experiences, and that knowledge and those experiences are valuable resources for mathematics teaching and learning.

We know that when classroom experiences and reasoning are meaningfully connected to students' ways of knowing, the learning that occurs—both cognitively and culturally—is powerful and lasting (National Research Council [NRC], 2000). By grounding learning in students' own cultural and community histories, a teacher has the opportunity to create both deeper knowledge and greater valuation of students' own culture, the sort of *cultural competence* called for by Ladson-Billings and Tate (1995).

**Empower Students to Confront and Solve Real-World Challenges They Face.** TMSJ helps students to build a *critical consciousness*, identifying issues that are unjust (Ladson-Billings & Tate, 1995), and then to use mathematics as a tool to analyze, critique, and confront those unjust contexts. The teacher's role is to learn about his or her students to identify generative themes, and thus help them to uncover and explore the issues of injustice their families and communities face. One of our lesson authors provided a few specific strategies to develop critical consciousness.

## TEACHING FOR CRITICAL CONSCIOUSNESS

by Shakiyya Bland, author of *Bringing Healthy Food Choices to the Desert*

In their book chapter, Arellano, Cintrón, Flores, and Berta-Ávila (2016) offer topics, themes, frameworks, and instructional activities to teach for critical consciousness. A few that stand out are as follows:

- Advocate for a social justice perspective across school, community, and political contexts.
- Use and further develop students' cultural funds of knowledge.
- Lead students to achieve at academically high standards across the core curriculum.
- Guide students to explore issues of prejudice, discrimination, and multiple forms of oppression involving people of different races, socioeconomic classes, language varieties, abilities and disabilities, and sexual orientation.
- Engage students in naming, interrogating, and transforming.
- Promote school transformation toward equity and social justice on multiple levels.

**Help Students Learn to Value Mathematics as a Tool for Social Change.** The potential of education is to support students to create better lives for themselves and a better society for each and every individual. Mathematics, seen as human

activity, is a powerful tool to achieve both of these goals (Skovsmose, 1994). When students use mathematics to explore, understand, and respond to social injustices they experience or care about, students learn not only the power of mathematics for social change, but also that they are actors on the world with the power to transform inequities and create social change. We want students to recognize that their mathematical power can improve the conditions of both their own lives and the lives of others.

## CONCLUSION

We believe building instruction from students' lived experience is paramount for developing the whole, mathematically proficient student. One teacher may demonstrate an algorithm on the board and require students to repeat the process. Another teacher may implement an inquiry lesson, then have students share their solution pathways. Both of these situations teach mathematics with a specific goal in mind. The first teacher likely has a focus on procedural fluency intended to help students be successful on standardized testing. The second teacher likely has a focus on teaching mathematics for increasing students' problem-solving ability. Both of these classroom lesson analogies exemplify teaching mathematics with good intentions, but the teacher goals are different.

Similarly, mathematics teachers must consider their goal as educators in a society that promotes justice by and for its citizens. Such a society requires informed and educated officials and citizens who can sift through rhetoric using logic and truth to guide policy, voting, and persuasion. A goal as a mathematics teacher teaching in a society governed by its people should be to engage students in critical inquiry about the world and potential injustices surrounding them, pushing students to imagine and create a world with justice, fairness, and equality. Providing students with opportunities to construct, revise, add to, and share the story with others, including the next generation, helps empower them to be active agents of change to improve justice in the world.

Similarly, we believe the same is true for mathematics teachers.

*I never thought about the importance of empowering my students to change their world. Now, having experienced the impact of a social justice teaching demonstration, I am constantly looking for ideas to incorporate social justice topics that affect my students into my mathematics lessons. . . . I would suggest that teacher educators require students to not only experience a social justice lesson within their program of study, but also design their own to use in their future classrooms. –Dacia Irvin, Baker Middle School, Muscogee County, GA, Teacher of the Year (2019)*

Dacia's comment shows how teaching a social justice lesson in the classroom impacted her view of teaching mathematics in a society that promotes justice for each and every person. She noted how her teaching empowered students to be active agents of change. She identified the need and desire to connect mathematics

and social justice concerns. It is evident that her experience teaching mathematics for social justice changed her view of what mathematics may be used for by teachers and students alike. As both students and teachers experience new ideas teaching mathematics for social justice, they begin to develop an orientation that can promote a more just and equitable society.

We are excited to share lessons contributed by educators across the United States that demonstrate their efforts to teach mathematics for social justice, and to achieve the four goals we've identified here. As teachers better understand how students learn mathematics, recognizing the importance of meaningful context and drawing upon students' cultural assets, it is an opportune moment to draw upon the generative themes they learn from their students to engage the students in mathematically rich activities and explore, understand, and respond to the social injustices they care about.

It is an opportune time for mathematics teachers to reshape not only how they teach mathematics but how they use what they teach as a tool to empower their students to be agents of change in their society and their own lives. To put it in Dacia's terms, it is time to empower "students to change the world."

## REFLECTION AND ACTION

1. Visit a colleague and initiate a conversation about why they became a teacher. Does the conversation draw on any of these lenses?
  - + Build an informed society.
  - + Connect mathematics with students' cultural and community histories.
  - + Empower students to confront and solve real-world challenges they face.
  - + Help students learn to use mathematics as a tool for social change.
2. Reflect on why Standards-Based Mathematics Instruction, Complex Instruction, Culturally Relevant Pedagogy, and Teaching Mathematics for Social Justice build on one another. Why is one essential for the next to be developed?
3. Create your own definition for social injustice and justice. How might you help students develop their own definitions?