



Bank Street

Occasional Paper Series

Occasional
Paper
Series

Volume 2019
Number 41 *Critical Mathematical Inquiry*

Article 9


March 2019

Elementary Mathematics and #BlackLivesMatter

Theodore Chao
The Ohio State University

Maya M. Marlowe
Weinland Park Elementary School

Follow this and additional works at: <https://educate.bankstreet.edu/occasional-paper-series>

 Part of the [Curriculum and Instruction Commons](#), [Curriculum and Social Inquiry Commons](#), [Educational Assessment, Evaluation, and Research Commons](#), and the [Educational Methods Commons](#)

Recommended Citation

Chao, T., & Marlowe, M. M. (2019). Elementary Mathematics and #BlackLivesMatter. *Occasional Paper Series, 2019* (41). Retrieved from <https://educate.bankstreet.edu/occasional-paper-series/vol2019/iss41/9>

This Article is brought to you for free and open access by Educate. It has been accepted for inclusion in Occasional Paper Series by an authorized editor of Educate. For more information, please contact kfreda@bankstreet.edu.

educate

Elementary Mathematics and #BlackLivesMatter

Cover Page Footnote

We are thankful to Sarah Dodson, Krystin Burgess, Stephanie Tape, Angela Tolbert, Brittany Bader, Lauren Woeste, Jessica James, Britni Boyer, Mallory Loless, and Amber Gregg for the ideas, plans, and revisions of the activity this manuscript is based upon. We are also very thankful for the guidance of Dorothy White, Marta Civil, Sylvia Celedon-Pattichis, the National Council of Teachers of Mathematics, and numerous anonymous reviewers for their caring and thoughtful feedback which helped us further develop and reflect upon this activity and manuscript.

Elementary Mathematics and #BlackLivesMatter

Theodore Chao and Maya Marlowe

Children, not yet aware that it is dangerous to look too deeply at anything, look at everything, look at each other, and draw their own conclusions. They don't have the vocabulary to express what they see, and we, their elders, know how to intimidate them very easily and very soon. But a black child, looking at the world around him, though he cannot know quite what to make of it, is aware that there is a reason why his mother works so hard, why his father is always on edge. He is aware that there is some reason why, if he sits down in the front of the bus, his father or mother slaps him and drags him to the back of the bus. He is aware that there is some terrible weight on his parents' shoulders, which menaces him. And it isn't long—in fact it begins when he is in school—before he discovers the shape of his oppression, (Baldwin, 1985, p. 326).

Welcome (Some of You) to Peace Park

Maya, a veteran elementary educator, talks to her first-graders as they sit on the carpet. Maya's class is comprised entirely of Black and Latinx children. Maya asks her students to partner up and discuss "What do you think the word 'fair' means? What do you think it means to be fair?" After the children talk for two minutes, they share that fairness means "equal," "you get the same number," "everyone gets the same amount," and "sharing." Maya writes these ideas on the front board, helping her students expand their thoughts about fairness to include "treating everyone with honesty and respect," "cooperating with people," and making sure "others are not treated poorly."

Maya then reminds her children of a prior mathematics lesson on Rosa Parks and the Montgomery bus boycott (Chao & Jones, 2016), in which, as a way to explore how mathematics can be used to confront unfair treatment, they counted up how much money Montgomery lost as a result of the boycott. Today's lesson moves to modern times, exploring the mathematics involved in the formation of the #BlackLivesMatter movement so that her children can see themselves as citizens who are empowered by mathematics and who recognize that our struggle for justice is far from over.

Over two decades of teaching, Maya has learned how to curate a classroom space safe for all voices to engage in discussions about the importance of diversity, restorative justice, empathy, loving engagement, and Black families — some of the guiding principles of the #BlackLivesMatter movement (Watson, Hago-pian, & Au, 2018; "What We Believe," 2018). She is extremely sensitive to the emotional and psychological well-being of her children and makes sure her students and families always have a safe space to voice opinions and concerns, particularly when connecting her teaching to topics that could trigger violent and traumatic feelings. For instance, before delving into this lesson about #BlackLivesMatter, Maya engaged in conversation with her students' families about how they speak about the #BlackLivesMatter movement with their children at home. The #BlackLivesMatter movement is especially pertinent in our community, as the police murder of 12-year-old Tamir Rice at a public park took place only a two-hour drive away. Maya's dedication to her students' safety and well-being mirrors Leonard's (2018) warning about precautions to take when teaching mathematics for social justice.

Maya often launches her lessons using a picture book or a story. Today, she starts with *The Three Billy Goats Gruff* (Galdone, 1973), a tale about a mean troll who prevents billy goats from crossing a bridge to get to some sweet green grass on the other side. Children giggle as the troll tries to stop each billy goat, finally bursting into a chorus of laughter at the end, when the biggest billy goat rams the troll off the bridge. After reading the story, Maya asks the children to talk to their partners about how the troll was not being fair, reminding them to align their discussion with the ideas about fairness they generated earlier. Using evidence from the story, children point out that the troll was not being fair because it did not treat the billy goats with honesty and respect.

Next, Maya walks to the side wall and introduces Peace Park. Children giggle with excitement as she tells them about Peace Park's amenities: swings, water slides, free popsicles, basketball courts, a bubble area, an outdoor skating rink, live music, and a swimming pool! Maya points to two signs reading, "Yes" and "No" (see Figure 1). Just like the mean troll who stops the billy goats from crossing the bridge, something can stop the children from entering Peace Park. This obstacle, however, has a mathematical form: the probability of landing on blue, depending on which one of two spinners a child uses, that determines if the child can enter Peace Park ("Adjustable Spinner," 2016).

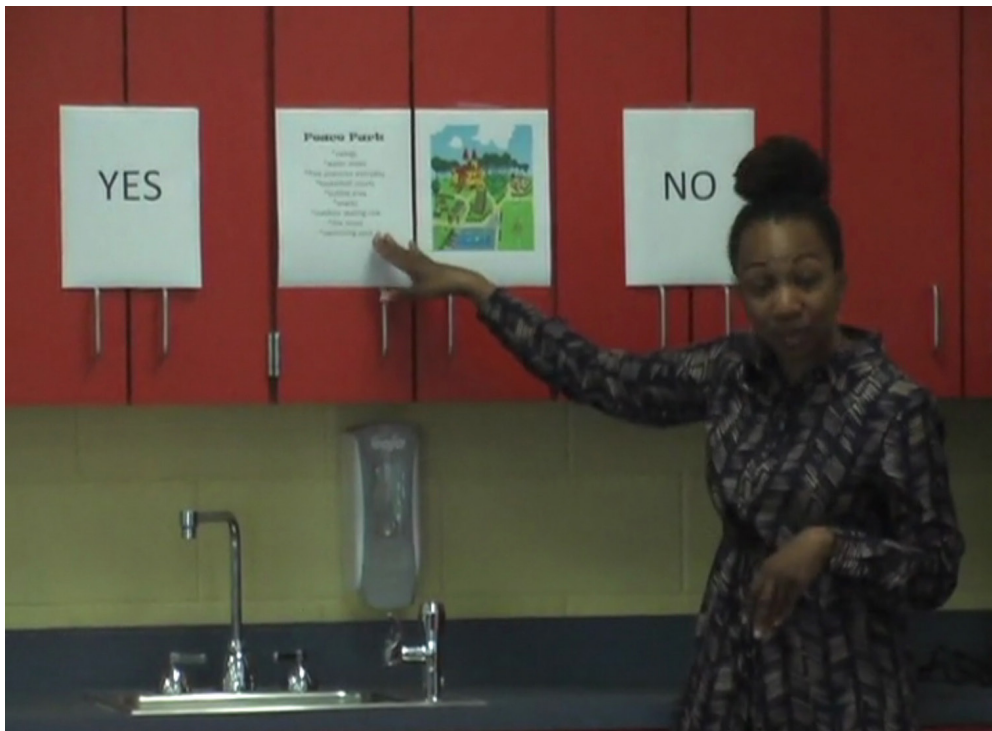


Figure 1. Maya introduces Peace Park to her students

Without explaining what the spinners mean, Maya helps the children choose which one they want to use. The students giggle as they approach a computer with two spinners displayed on the screen, one of which they'll spin to find out if they are allowed into Peace Park (see Figure 2).

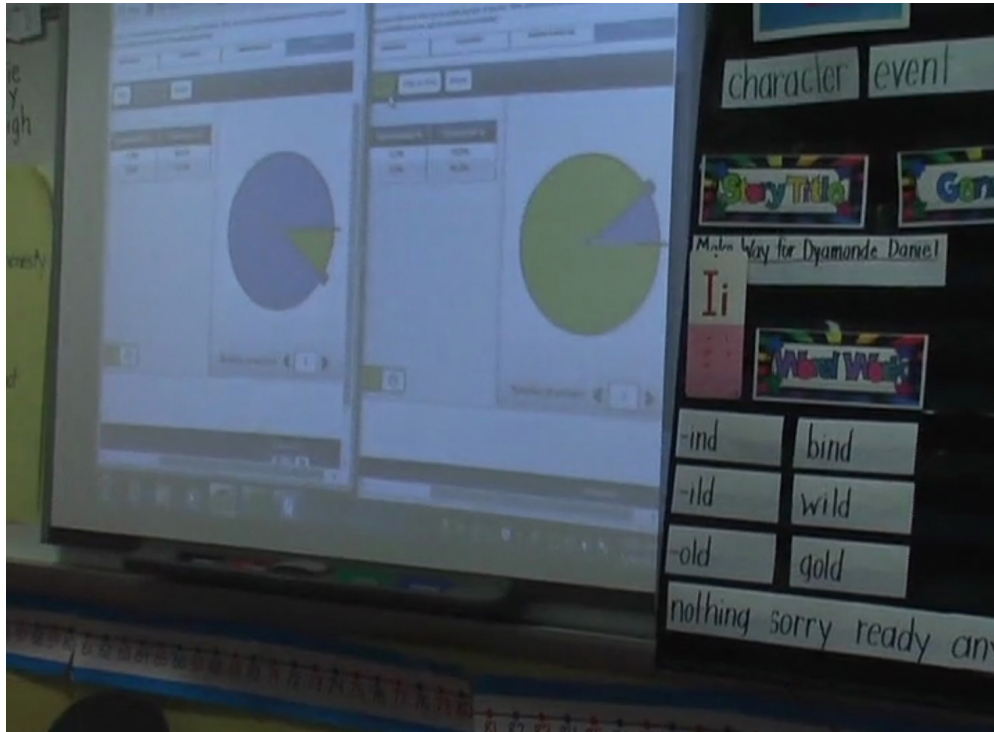


Figure 2. The two different spinners used by children to determine entry into Peace Park

Children must spin onto the blue color to be let into Peace Park. The left spinner is 86 percent blue, while the right spinner is 14 percent blue. Before the students take their turns, Maya asks, “Do you think these spinners are fair? Who do you think will get into the park?” Students shout out various answers, eager for an opportunity to spin. Then, one by one, the children approach the spinners and choose one to spin. When a child spins onto blue, Maya high-fives them, shouting, “Welcome to Peace Park!” and directs the child to the “Yes” sign. If a child spins onto yellow, Maya directs the child to the “No” sign.

After every child has taken a turn, Maya asks the children to count who entered Peace Park and who did not. Together, they count that five children entered Peace Park, while 13 did not. The students then count who spun the left spinner and who spun the right spinner. They determine that none of those who spun the right spinner entered Peace Park and that six of the 11 children who spun the left spinner didn’t get into Peace Park either.

Maya asks the children who did not get in, “How do you feel that you didn’t get into Peace Park?” A child raises their hand and says, “I feel sad because I didn’t get to come in.” Maya asks the student to explain why and to connect their reason to one of the definitions of fairness from earlier. The child replies, “I was being treated badly.”

Another student raises their hand, “I think it’s unfair because there’s only five people over there [in Peace Park] and more over here.” Maya responds, “So you think more people should be able to get in?” “Yes,” says the child.

Maya then turns to the five children that did enter Peace Park and asks, “How does it feel to get into Peace Park?” One child shouts in excitement, “Cool!” Another child raises both hands, yelling “Whoo!” A third child gestures with a wavering hand, “I feel bad that other people didn’t get to come in.”

Next Maya arranges the students in small groups to discuss and then journal about (a) who got into Peace Park, who didn’t, and why; (b) how the two spinners were different and what fair spinners would look like; and (c) how the children felt about having two different spinners. After journaling, students share their thoughts. One child says, “None of [the people who used the right spinner] got to go in and I think I know why. The [right spinner] got a lot of yellow, and the [left spinner] got a lot of blue. So, we [right-spinner group] automatically got all no. That is not, not, not, no, no fair.”

Maya then asks the children how they would make the situation fairer. Students share various suggestions, such as making sure the spinners have the same amount of blue and yellow, requiring everyone to use the same spinner, or doing away with the spinners entirely and letting everyone into Peace Park. Maya then orchestrates a discussion about what it feels like for those who were restricted from entering Peace Park and how we all heal when we listen to those who are not being treated with honor and respect. Maya connects the conversation back to the lesson on the Montgomery bus boycott and the ensuing protest marches of the Civil Rights movement, leading to a classroom discussion during which children decide that they could lead a march to let people know about how the spinners are not fair. Maya finishes the lesson by revealing that the unfairness represented by these spinners was one reason why three Black women—Alicia Garza, Patrisse Cullors, and Opal Tometi—started the #BlackLiveMatter movement (Watson et al., 2018), specifically to show everyone how some people were not being treated with honesty and respect.

In this lesson, the spinners mirror actual racial profiling traffic statistics from Ferguson, Missouri, in 2013 (Madrigal, 2014), shortly before the police murdered Michael Brown and subsequent protests crystallized the national #BlackLivesMatter movement (Hill, 2016). In this activity and its discussions, children confront the statistics from Ferguson County, in which Black citizens in 2013 accounted for 86 percent of the traffic pull-over stops and 92 percent of the car searches, even though Black citizens made up only 67 percent of the population of Ferguson County.

Maya has also taught this lesson to fifth-graders, extending the context and the mathematics in age-appropriate ways. When working with the older students, Maya replaced *The Three Billy Goats Gruff* (Galdone, 1973) with *Ghost Boys* (Rhodes, 2018), which details how a community and a ghost deal with societal anti-Blackness after a police officer murders a 12-year-old boy holding a toy gun. During the final discussion, Maya reveals that these spinners represent the difference in being pulled over by police officers in Ferguson, Missouri, depending on whether you were Black or not Black, shortly before Michael Brown was murdered. Maya orchestrates that discussion around the use of rational numbers and probability to

describe whether a situation is “fair” or not, having students compare the 86 percent-blue spinner to the 14 percent-blue spinner. Maya then makes the connection to the mathematics of the use of economic boycotts—such as the Montgomery bus boycott the class had studied earlier, the #NotOneCent boycott of Black Friday shopping, and the boycott of National Football League games—as a form of protest. Children finish the lesson by writing in their journals about ways they can use mathematics to describe when a situation is unfair and, furthermore, how they can use mathematics in collective economic protests.

Origins of the Peace Park Lesson

The vignette presented above details a lesson based on an activity that a group of elementary pre-service teachers in a Master’s degree teacher licensure program created. The group was mentored by the authors: Theodore, who instructed them in an elementary mathematics methods course and Maya, who served as a cooperating teacher to one of the pre-service teachers. On November 25, 2014, the day after police officer Darren Wilson was found not guilty of the murder of Michael Brown, the group decided to develop a mathematics-related activity for young children to explain what was happening in Ferguson. The teachers wanted to create a role play of the daily unfair experiences with racial profiling that the #BlackLivesMatter protests in Ferguson centered upon, using racial-profiling statistics in Ferguson in a way that children could understand. Maya and Theodore guided the teachers toward adapting an activity called “Driving While Black or Brown” (Gutstein, 2013), a middle-school lesson that appeared in *Rethinking Mathematics* (Gutstein & Peterson, 2005), a volume of social justice-themed mathematics lessons and commentary. “Driving While Black or Brown” explores the different statistical probabilities of someone being pulled over by police officers, depending on whether the driver is White, Black, Latinx, Asian, or Native American. Because practices such as racial profiling are inequitable and perpetuate race-based differences in access, they are strongly connected to modern social justice movements and demonstrations. As Leonard (2018) states, “Teachers of mathematics can build student awareness of #BLM by using data collected on traffic stops” (p. 202).

Together with the pre-service teachers, we found publicly available police arrest records from the state of Missouri (Madrigal, 2014), and then connected them to the first- and second-grade Common Core State Mathematics Standard of learning to represent and interpret data (CCSS 1.MD.C.4, 2.MD.D.9, and 2.MD.D.10). In order to adapt this middle-school lesson for elementary grades, we had to (a) modify the mathematics so that it was less about proportional reasoning and rational numbers and more about understanding probability, (b) introduce an age-appropriate role-play context for early elementary students—such as crossing a bridge to a park—that was not as terrifying as racial profiling or murder by the police, and (c) consult with a child psychologist about avoiding and mitigating potential trauma invoked by the lesson. We then revised the activity so it fit within the context of Maya’s classroom community, Maya’s pedagogical practice, and the guiding principles of #BlackLivesMatter: diversity, restorative justice, empathy, loving engagement, and Black families (“Herstory,” 2018; Watson et al., 2018).

Preparing the Classroom Space for Children's Emotional and Psychological Well-Being

I, Maya, use the first-person voice here to speak specifically about how I prepare my classroom for lessons such as this one.

I want the children in my classes to learn about themselves by studying Black people, places, and events of the past and of the present and also to understand the social and racial issues impacting our Black community. My goal as an elementary educator is for my children to create counter-narratives to the racist and damaging stereotypes about Black people that permeate our community. I want my teaching to instill an awareness of social issues impacting Black people, helping my children find their voices to challenge social and racial injustice. Education is emancipation. My children learn to embrace their own culture and history with pride, to learn to be unapologetically Black, and to engage in true empathy and loving engagement with Black villages and Black families. These experiences lay the foundation for them to give back to the Black community and empower it when they become adults. While not all of my students are Black, the lessons everyone in the class learns from understanding the magnificent struggle from emancipation to civil rights to ending mass incarceration connect to the history of all oppressed peoples, particularly the history of my Latinx students, who face similar struggles in our community.

There are five established principles in my classroom that highlight Black culture and the evolving nature of racism. First, every month (not just Black History Month), we focus on specific Black role models and display images of them (e.g., Kings and Queens of Africa, Black authors, and #BlackLivesMatter activists) on our bulletin boards. Second, our classroom library is stocked with books written by and about Black people (and other authors of color). Third, every topic of study is aligned or connected with Black culture. For instance, when we study fairy tales, we include fairy tales that connect to African or Black American culture. Fourth, we integrate modern Black popular culture into our activities through popular songs, trends, and dances. For example, we are currently studying the lyrics of J. Cole's *Be Free*, a tribute to Michael Brown, in our poetry unit. Finally, our classroom walls, anchor charts, and teaching examples always include images of Black people so children see representations of themselves everywhere in my classroom. As the Latinx population in our community is growing, I create the same amount of representation of Latinx role models and authors (and other people of color) in my classroom library and on my walls, too.

I used these principles to incorporate the Peace Park lesson into our ongoing classroom discussion. For background, we discussed the history of the Civil Rights movement and role-played how Rosa Parks used bravery and non-violent methods to start a boycott of an unfair bus system that denied seats to Black people (Chao & Jones, 2016). We studied the terms racism, segregation, prejudice, and social justice. Then, to connect these ideas to the current #BlackLivesMatter movement, we discussed the lives of Trayvon Martin and Tamir Rice (Watson et al., 2018). We discussed the norms of compliance with the police, how to handle things when you are not treated fairly, how to avoid using violence, and how to speak up. We discussed how we cannot succumb to violence despite the fact that fear and intimidation

have been tools used to attack the Black community. We discussed how people rose up to protest unfair ways police treated Black people using the slogan #BlackLivesMatter to organize these protests through social media throughout the country.

I am fortunate to have a respectful relationship with many of the families in my community. This relationship is built upon trust and enables my administration and (usually) my families to know that I have the children's best interest at heart and not to challenge what I am doing in the classroom. Occasionally, parents will object to my classroom practices as inappropriate or not educationally sound, but my administration has always supported me and my pedagogical decisions.

It is critically important to have established these relationships of trust with the community I work with before formally connecting social justice constructs to my mathematics lessons. Because I am also my children's literacy teacher, I have more freedom in engaging them in ideas about fairness and the historical oppression of our people. But I also want to warn teachers who want to do this work that they must take caution. In my experience, it has been important to let the guidance counselor and the district child psychologist know what I am doing, to first talk to families about the nature of the conversations they are having at home, and to make sure that in all my teaching, I am aware of the emotional and psychological well-being of my children. Some of them have already been traumatized, and because of the color of their skin, they will continue to be traumatized for the rest of their lives by our nation's anti-Black violence. My classroom is not a place where I want to induce more trauma, but rather a space of loving engagement in which my children learn about their power and about ways to continue to grow this power through love, empathy, and the growing of their Black villages. My classroom is a space where all my children can breathe.

Equity, Power, and Creative Insubordination in Elementary Mathematics Teaching

Mathematics teaching for social justice at the elementary and early childhood level must connect formalized mathematics to the complex and sophisticated mathematics already present in children's histories and communities (Civil, 2007, 2009; Turner, Gutiérrez, Simic-Muller, & Díez-Palomar, 2009). For young children, stories and play are real-world situations (Parks, 2015; Wager, 2013). We situate social justice mathematics at the elementary level by connecting to and honoring children's histories, stories, and fairy tales that highlight mathematics and ways children can use mathematics to recognize and confront the injustice they notice (McCormick Smith & Chao, 2018; Parks & Wager, 2015; Wager, 2013; Ward, 2017).

Our work in teaching mathematics for social justice revolves around the following ideas. First, all children are capable of sophisticated mathematical thinking, which develops as we listen to and pay attention to children as well as to the social identities and cultures that children use to position themselves (Hand, 2012; Louie, 2018). Second, children have the capacity to think in sophisticated ways about fairness (Chao & Jones, 2016; Tan, Barton, Turner, & Gutiérrez, 2012). Third, children bring a wealth of mathematical knowledge from their communities and families with them into the classroom (Aguirre &

del Rosario Zavala, 2013; Civil, 2007; Turner et al., 2009). Children live in spaces in which mathematics is often used—they see it, they observe it, and they know it. Fourth, connecting this knowledge to the formalized mathematics in the classroom helps children develop strong mathematical identities (Aguirre, Mayfield-Ingram, & Martin, 2013). Fifth, any form of mathematics teaching for equity and social justice is posturing if it does not attempt to empower the global collective Black, a term used by Bonilla-Silva (2004) to describe the dark-skinned populations often placed at the bottom of racial stratification systems (Martin, 2015). Sixth, for young children, expressions of unfairness (“It isn’t fair!”) are routinely dismissed by the adults around them as infantile complaints. Yet when an expression of unfairness is followed up with a mathematical explanation (“It isn’t fair because they used a spinner with less blue”), adults are forced to evaluate the legitimacy of the claim. Seventh, recognizing injustice through using mathematics is not enough; children must also use mathematics to confront injustice by what Gutstein (2006), in reference to Freire (1970), calls writing the world with mathematics and what Gutiérrez (2013) calls creative insubordination. While Gutiérrez frames creative insubordination as something that teachers and administrators do, Maya believes that children are also capable of creatively insubordinate thoughts and actions. Finally, in recognition of the collective action happening around the world as the #BlackLivesMatter movement, we see that mathematics teaching for social justice is incomplete if it does not touch on the guiding principles of #BlackLivesMatter: diversity, restorative justice, globalism, queer affirming, unapologetically Black, collective value, empathy, loving engagement, transgender affirming, Black villages, Black women, Black families, and intergenerational (Leonard, 2018; Watson et al., 2018). Therefore, teaching mathematics for social justice to children revolves around empowering children of the collective Black—particularly by using tools of loving engagement, restorative justice, and empathy—to use mathematics to call out and confront unfairness in their lives so that adults in power around them recognize that unfairness.

Maya’s Growth through the Peace Park Activity

I, Maya, again use the first-person voice here to reflect upon my growth through this lesson.

While I have learned to connect issues impacting the Black community to my language arts and social studies lessons, exploring social justice through a mathematical lens was something I only started to do through this activity. After this lesson, my children “felt” unfairness and learned how to highlight social injustice using mathematical data. In our first enactment of the lesson, the children who did not get to enter Peace Park were genuinely upset; their negative emotions were real. Some children bordered on crying, some children pouted, and others were just plain mad. We addressed this anger and other emotions through class discussion, connecting again to our lessons on the history of Black struggle and to how we can take action against unfairness and racism. Having an opportunity to journal and discuss what we had just experienced allowed the children to reflect on how they could move beyond anger to take action. In subsequent lessons, I have tried to better reflect real-world situations by randomly giving students stickers labeled “Black” or “Not Black” in order to create more empathy and understanding over the arbitrary and violent use of race as a category.

Closing Thoughts

We end with our reflections and suggestions from teaching and revising this activity in our classrooms and various professional development presentations over the past four years. While we enjoy sharing this activity, we still find that because of the very real and scary implications of the statistics revealed in the lesson, self-reflection is absolutely necessary every time we teach it—particularly as the #BlackLivesMatter movement grows stronger, more vital, and more indispensable. This self-reflection works well when we include parents and community members in dialogue about how this lesson went and how we can support these ideas throughout the school year.

After the first time we taught this lesson, we felt satisfied with how it connected to social studies and language arts. However, we are aware of the tension in engaging children in doing and learning mathematics through using data as a means of discovering, sharing, and confronting problems in the community. We note that this content goes beyond what is proposed in the first-grade content standards. As we explained earlier, teaching mathematics for equity involves viewing children's strategies through a lens of culture and identity; recognizing children's sophisticated ways of thinking about fairness; valuing community and family funds of knowledge; helping children develop strong identities as mathematical thinkers; empowering the collective Black; engaging children in using mathematics to justify to adults the children's expressions of unfairness; and employing the guiding principles of #BlackLivesMatter. We feel that our evolving Peace Park activity as presented here still only touches upon some of these principles. We continue to work on how to empower the collective Black, engage children in using mathematics to justify their expressions of unfairness, and create mathematics lessons for children who are queer and transgender affirming.

In the future, we would like to place more emphasis on using data to highlight classroom issues (positive and negative) as well as on supporting children in understanding that social justice begins with individuals and their treatment of others. Therefore, we suggest the following extensions to this activity that more formally connect to mathematics.

1. *Having children create their own story problems/situations.* To increase their ownership of the story context, children should create their own mathematics story problems, extending from the story used at the beginning of the lesson, from the role-play, or from the experience of unfairness in general. Their final product would include a mathematics story problem or picture; a written component explaining why the situation is not fair; and mathematical data to support their position.
2. *Having children use their own data.* Children should gather their own data. For example, if the classroom encounters trouble finding healthy options during snack time, students can compile data showing the number of times healthy snacks are available versus the number of times they are not available. Children can chart this data in order to highlight problems involving food

justice and to spark dialogue in their classroom and community about solutions. This connects to the Common Core State Standard for Mathematics of learning to represent and interpret data (CCSS 1.MD.C.4, 2.MD.D.9, and 2.MD.D.10) as children create simple bar graphs to represent the data they have gathered.

3. *Reflecting real-world situations.* We have experimented with having children wear “Black” or “Not Black” labels to make the lesson more realistic, yet not based on students’ self-identified racial categories. We find that when this activity is presented in child-appropriate ways, the inclusion of race as a factor is something that children realistically engage with critically and mathematically. We caution readers again about the dangers of introducing emotional and psychological trauma into their classrooms. But we also encourage readers to engage in school-wide dialogue about ways to speak about race in ways that engage Black children in feeling proud and unapologetically Black in and out of school.
4. *Modeling fairness through teaching about division.* In introducing fractions and other rational numbers, the concept of fairness can be aligned with the fair sharing of finite resources (Empson & Levi, 2011). When sharing materials, do children feel they are treating each other with respect and that everyone has the same amount? Extending the activity to incorporate ways to express how the billy goats would share the sweet green grass or how children would share a finite number of snacks (e.g., slices of cheese) or a finite amount of materials (e.g., modeling clay) connects ideas of fairness to multiplication, division, and rational number concepts.
5. *Connecting to families.* Family members are always present in Maya’s classroom as volunteers, which helps connect classroom experiences to the discussions that children have at home. More explicit connections to families can be made through letters and emails home and questions related to fairness that children can ask their families. These connections can be further strengthened when families are present to participate in the lessons.
6. *Adapting scenarios for older children.* We continually see ways to extend this activity to connect to the concept of (dis)proportionality for higher-level grades. For instance, we can incorporate recent statistics from Baltimore, Maryland, where Freddie Gray died in police custody (Hill, 2016) or general statistics about police violence toward Black men. These statistics focus on the mathematics of *drawing comparative inferences between two populations* (CCSS 7.SP.B.3, 7.SP.B.4), *investigating chance processes*, and *developing, using, and evaluating probability models* (CCSS 7.SP.C.5, 7.SP.C.6, 7.SP.C.7). We use these examples only with older children, as we feel direct discussion of murders committed by police is too traumatic for younger children. We again warn that these statistics are horrifying; they provide mathematical depictions of the epidemic of police-led violence against our Black communities.
 - a. We can use statistics to highlight the tremendous amount of undue force used in Baltimore, a majority Black community (Hill, 2016). We can extend our activity using one spinner that

shows that 39 percent of the time, an encounter with a police officer in Baltimore involves force or the threat of force (Puente & Perna, 2014) while using another spinner that shows that an encounter with a police officer nationally involves force or the threat of force only 1.4 percent of the time (“Bureau of Justice Statistics (BJS) – Use of Force”, n.d.). In our discussion, we would ask older students, “What inequities do these statistics unveil? How can these statistics lead to empowering the collective Black and strengthening the guiding principles of #BlackLivesMatter, such as empathy, restorative justice, and Black families?”

- b. Another extension of our activity can focus on the statistic that Black males are murdered by police at a rate of 21 times more than white males (Gabrielson, Sagara, & Grochowski Jones, 2014). We can have students mathematically model this alarming statistic. In a discussion about it, we could ask what could possibly account for this statistic and how it can be used to motivate collective action.

The Peace Park activity and the ensuing discussion are continual works in progress for us. We are excited to share our experiences with this activity and how we have tried to incorporate the guiding principles of the #BlackLivesMatter movement into elementary-school mathematics lessons to engage children not only in their mathematics thinking, but also in their global citizenship and empathy.

Reflection and Discussion Questions

1. How do you explore issues of social justice in your teaching, particularly issues that might be controversial but are pertinent?
2. How are your children exposed to mathematicians and role models who look like them? Are there only predominantly white and male representations of mathematicians and role models in your examples, books, or wall art?
3. How do you integrate your children’s pop culture (i.e., current songs, fashion, or social media) in your teaching?
4. How does your teaching connect to your children’s communities and families? How do your children talk about or include their ancestors into their mathematics talk? How do members of your community know about what your classroom is doing? How have you incorporated the history of the community into your teaching?
5. How do you incorporate real statistics from your children’s communities and families into your mathematics lessons?
6. How can you do this while still maintaining a playful environment?

Acknowledgements

We are thankful to Sarah Dodson, Krystin Burgess, Stephanie Tape, Angela Tolbert, Brittany Bader, Lauren Woeste, Jessica James, Britni Boyer, Mallory Loless, and Amber Gregg for the ideas, plans, and revisions of the activity this manuscript is based upon. We are also very thankful for the guidance of Dorothy White, Marta Civil, Sylvia Celedon-Pattichis, the National Council of Teachers of Mathematics, and numerous anonymous reviewers for their caring and thoughtful feedback, which helped us further develop and reflect upon this activity and manuscript.

References

- Adjustable Spinner. (2016). Retrieved from <https://illuminations.nctm.org/adjustablespinner/>
- Aguirre, J. M., & del Rosario Zavala, M. (2013). Making culturally responsive mathematics teaching explicit: A lesson analysis tool. *Pedagogies: An International Journal*, 8(2), 163–190. <https://doi.org/10.1080/1554480X.2013.768518>
- Aguirre, J. M., Mayfield-Ingram, K., & Martin, D. B. (2013). *The impact of identity in K-8 mathematics: Rethinking equity-based practices*. Reston, VA: National Council of Teachers of Mathematics. Retrieved from <http://www.nctm.org/catalog/product.aspx?ID=14119>
- Baldwin, J. (1985). A talk to teachers. In J. Baldwin, *The price of the ticket: Collected nonfiction 1948–1985* (pp. 325–333). New York, NY: St. Martin's Press.
- Bonilla-Silva, E. (2004). From bi-racial to tri-racial: Towards a new system of racial stratification in the USA. *Ethnic and Racial Studies*, 27(6), 931–950.
- Bureau of Justice Statistics. (n.d.) Use of Force. Retrieved from <http://www.bjs.gov/index.cfm?ty=tp&tid=84>
- Chao, T., & Jones, D. (2016). That's not fair and why: Developing social justice mathematics activists in pre-K. *Teaching for Excellence and Equity in Mathematics: Special Issue on Social Justice*, 7(1), 15–21.
- Civil, M. (2007). Building on community knowledge: An avenue to equity in mathematics education. In N. S. Nasir & P. Cobb (Eds.), *Improving access to mathematics: Diversity and equity in the classroom* (pp. 105–117). New York, NY: Teachers College Press.
- Civil, M. (2009). A reflection on my work with Latino parents and mathematics. *Teaching for Excellence and Equity In Mathematics*, 1, 9–13.
- Empson, S. B., & Levi, L. (2011). *Extending children's mathematics: Fractions and decimals: Innovations in cognitively guided instruction*. Portsmouth, NH: Heinemann.
- Freire, P. (1970). *Pedagogy of the oppressed* (30th anniversary ed.). New York, NY: Continuum.
- Gabrielson, R., Sagara, E., & Grochowski Jones, R. (2014, October 10). Deadly force, in black and white. *ProPublica*. Retrieved from <http://www.propublica.org/article/deadly-force-in-black-and-white>

- Galdone, P. (1973). *The three billy goats gruff*. Boston, MA: Houghton Mifflin Harcourt.
- Gutiérrez, R. (2013). The sociopolitical turn in mathematics education. *Journal for Research in Mathematics Education*, 44, 37–68.
- Gutstein, E. (2006). *Reading and writing the world with mathematics: Toward a pedagogy for social justice*. New York, NY: Routledge.
- Gutstein, E. (2013). Driving while Black or Brown. In E. Gutstein & B. Peterson (Eds.), *Rethinking mathematics: Teaching social justice by the numbers* (2nd ed.) (pp. 16–18). Milwaukee, WI: Rethinking Schools.
- Gutstein, E., & Peterson, B. (2005). *Rethinking mathematics: Teaching social justice by the numbers*. Milwaukee, WI: Rethinking Schools.
- Hand, V. (2012). Seeing culture and power in mathematical learning: Toward a model of equitable instruction. *Educational Studies in Mathematics*, 80(1–2), 233–247.
- Herstory. (2018). Retrieved from <https://blacklivesmatter.com/about/herstory/>
- Hill, M. L. (2016). *Nobody: Casualties of America's war on the vulnerable, from Ferguson to Flint and beyond*. New York, NY: Atria.
- Leonard, J. (2018). *Culturally specific pedagogy in the mathematics classroom: Strategies for teachers and students* (2nd ed.). New York, NY: Routledge.
- Louie, N. L. (2018). Culture and ideology in mathematics teacher noticing. *Educational Studies in Mathematics*, 97(1), 55–69. Retrieved from <https://doi.org/10.1007/s10649-017-9775-2>
- Madrigal, A. C. (2014, August 15). How much racial profiling happens in Ferguson? *The Atlantic*. Retrieved from <http://www.theatlantic.com/technology/archive/2014/08/how-much-racial-profiling-happens-in-ferguson/378606/>
- Martin, D. B. (2015). The collective Black and principles to actions. *Journal of Urban Mathematics Education*, 8(1), 17–23. Retrieved from <http://ed-osprey.gsu.edu/ojs/index.php/JUME/article/view/270>
- McCormick Smith, M., & Chao, T. (2018). Critical science and mathematics early childhood education: Theorizing Reggio, play, and critical pedagogy into an actionable cycle. *Education Sciences*, 8(4), 162. Retrieved from <https://doi.org/10.3390/educsci8040162>
- Parks, A. N. (2015). *Exploring mathematics through play in the early childhood classroom*. New York, NY: Teachers College Press.
- Parks, A. N., & Wager, A. A. (2015). What knowledge is shaping teacher preparation in early childhood mathematics? *Journal of Early Childhood Teacher Education*, 36(2), 124–141. Retrieved from <https://doi.org/10.1080/10901027.2015.1030520>
- Puente, M., & Perna, A. (2014, September 18). Sun investigates: Undue force. *The Baltimore Sun*. Retrieved from <http://data.baltimoresun.com/news/police-settlements/>

- Rhodes, J. P. (2018). *Ghost Boys*. New York, NY: Little, Brown Books for Young Readers. Retrieved from https://www.amazon.com/dp/B074M6GB8Y/ref=dp-kindle-redirect?_encoding=UTF8&btkr=1
- Tan, E., Barton, A. C., Turner, E., & Gutiérrez, M. V. (2012). *Empowering science and mathematics education in urban schools*. Chicago, IL: University of Chicago Press.
- Turner, E. E., Gutiérrez, M. V., Simic-Muller, K., & Díez-Palomar, J. (2009). "Everything is math in the whole world": Integrating critical and community knowledge in authentic mathematical investigations with elementary Latina/o students. *Mathematical Thinking and Learning*, 11(3), 136–157.
- Wager, A. A. (2013). Practices that support mathematics learning in a play-based classroom. In L. D. English & J. T. Mulligan (Eds.), *Reconceptualizing early mathematics learning* (pp. 163–181). Heidelberg, Germany: Springer Netherlands. Retrieved from https://doi.org/10.1007/978-94-007-6440-8_9
- Ward, J. (2017). *Early childhood mathematics through a social justice lens: An autoethnography*. (Doctoral dissertation). Retrieved from <https://scholarcommons.usf.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=8172&context=etd>.
- Watson, D., Hagopian, J., & Au, W. (Eds.). (2018). *Teaching for Black lives*. Milwaukee, WI: Rethinking Schools.
- What We Believe. (2018). Retrieved from <https://blacklivesmatter.com/about/what-we-believe/>



Theodore Chao is an assistant professor of Mathematics Education in the Department of Teaching and Learning at The Ohio State University. His research agenda involves empowering all students and teachers regardless of social identity (race, gender, socioeconomic status, etc.) to learn and teach mathematics, particularly through technology. He uses Photovoice interviews to explore how mathematics teachers of color connect their mathematics teacher identities with racialized social identities. He also builds mobile app technology to help children share mathematical strategies with each other, opening windows for teachers to listen to their children’s mathematical thinking.



Maya Marlowe is an educator with Columbus City Schools in Columbus, Ohio. She has 18 years of experience as a classroom teacher and eight years as a literacy coach. She is a passionate instructional leader who creates academically challenging classroom environments in which students develop positive relationships with staff and their peers, learn about their culture, and acquire a sense of social justice through the examination of issues that occur in their communities and the world.