SOCIAL JUSTICE MATH IN ACTION: FROM EDUCATIONAL MODEL TO EDUCATIONAL MOVEMENT
GOALS FOR TODAY

Advance the role of math in fostering social justice by:

- Expanding awareness of various approaches to Social Justice Mathematics
- Building a common conversation about how Social Justice Mathematics contributes to educational equity
- Highlighting ways to advance the implementation of Social Justice Mathematics in K12 and higher education
AGENDA

- Introduction: Just Equations and Co-sponsors
- **John W. Staley, Ph. D.** – *High School Mathematics Lessons to Explore, Understand, and Respond to Social Injustice*
- **Lori Beth Way, Ph. D.; Savita Malik, Ed.D.; Ramona I. Coates, Ph.D.** – Metro College Success Program, San Francisco
- **Mele Sato, M.Ed.** – Social Justice Math in the Classroom
- Resources
JUST EQUATIONS
Reconceptualizing the role of math in ensuring educational equity
PREVAILING ARCHITECTURE OF MATH OPPORTUNITY
EQUITY DIMENSIONS OF MATH EDUCATION

Content
Instruction
Assessment
Readiness Policies & Structures
We work to advance:

- High School Math Pathway Redesigns
- Postsecondary Admissions and Access Policies
- Postsecondary Math Pathway Redesigns
CO-SPONSORS

The Education Trust—West

TODOS: Mathematics for ALL Excellence and Equity in Mathematics
High School Mathematics Lessons to Explore, Understand, and Respond to Social Injustice

John W. Staley, Ph. D., Coordinator, Special Projects, Office of Data Analytics, Division Research, Accountability, and Assessment, Baltimore County Public Schools
Just Equations Social Justice Math Webinar
November 17, 2020

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Chair, US National Commission on Mathematics Instruction
Past President, NCSM

Connect with us
Twitter: @SJMathematics
Facebook Group: HS Math Lessons to Explore Social Injustice

This webinar is co-sponsored by the Education Trust-West and TODOS: Mathematics for All.
Why?

Teaching Math for Social Justice (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. (p. 23)
Part I: Teaching Mathematics for Social Justice

Chapters
1. What is Social Justice and Why does It Matter in Teaching Mathematics?
2. Getting Ready for the Classroom
4. Teaching the Social Justice Mathematics Lesson
Social Justice considers...

...the contributions and rights of each and every person in society

- Access
- Participation
- Empowerment
- Human rights

...how we develop students’ deeper understanding and awareness

- Identity
- Diversity
- Justice
- Action

https://www.tolerance.org/sites/default/files/2017-06/TT_Social_Justice_Standards_0.pdf
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
• Help students learn to value mathematics as a tool for social change

Broadens the Purposes of Learning Mathematics

• Develop deep mathematical understanding as confident and capable learners (Elem, Middle)
• Expand professional opportunities (High)
• Understand and critique the world (All)
• Experience the wonder joy, and beauty of mathematics (All)

(p. 23)
(NCTM Catalyzing Change Series)
Teaching Math for Social Justice (TMSJ)

Picha, 2019. Presentation at NCTM, San Diego
- Status differences may result in students having less access to interaction
- Create multidimensional classroom, where every student is recognized to have mathematical ability
  - Cohen & Lotan and Horn

- Students’ own cultural practices, experiences, and assets
- Academic achievement, cultural competence, and critical consciousness
  - Ladson-Billings

- Youth play a critical role in the solution to injustice.
  - Gutstein, Moses, Gillen

- 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.
- Learning can emerge from a problem-posing pedagogy, designed around the ideas, hopes, doubts, fears, and questions that emerge in a person’s relationship with the world—“generative themes” (Freire)
  - Freire, Gutstein, Wager & Stinson

- Learning for understanding
- Discourse-rich learning environment marked by conjecture, reasoning, & justification
- Each and every student learns meaningful mathematics
  - Principles to Action

- Standards-Based Math Instruction (SBMI)
- Complex Instruction (CI)
- Culturally Relevant Pedagogy (CRP)
- Critical Math Education (CME)
- Teaching Math for Social Justice (TMSJ)
What Matters

Content
- Mathematics
  - Content – NCTM Essential Concepts
  - Practices
- Social Justice
  - Issue
  - Teaching Tolerance Standards & Outcomes

Context
- Purpose
- Audience
- Allies
- Timing

When
- Unit, Course, Special Opportunity
- Beginning, Middle, End
- Instructional Aim
  - Math Content Standards
  - Math Practices
  - Reteaching & activating prior knowledge
  - Continued learning & practice
  - Preview future course content

How
- Rich Tasks
- Three-Act Tasks
- Project-based Learning
Social Justice Mathematics Lesson Framework

Elements of a SJML Framework

1. Equitable Mathematics Teaching Practices
2. Authentic, Challenging Social and Mathematical Question or Concern
3. Social and Mathematical Understanding
4. Social and Mathematical Investigation
5. Social and Mathematical Reflection
6. Action and Public Product
Equitable Teaching Practices

- Going deep with mathematics
- Leveraging multiple mathematical competencies
- Affirming mathematics learners’ identities
- Challenging spaces of marginality
- Drawing on multiple resources of knowledge

Aguirre, Mayfield-Ingram, & Martin. (2013). The Impact of Identity in K-8 Mathematics: Rethinking Equity Based Practices, NCTM.

NCTM, Taking Action series and Principles to Action
Social Justice Mathematics Lesson Framework

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Part II: Social Justice Mathematics Lessons

Chapters

5. Number and Quantity
6. Algebra and Functions
7. Statistics and Probability
8. Geometry

22 Lessons
30+ Educators

Meaning for the coordinate plane through Solórzano and Delgado Bernal’s (2001) four “quadrants” of resistance.

Policies that separate children from their families at the United States/Mexico border examined by modeling with functions.

Examination of sampling bias and data distributions through understanding the role of the census to promote democracy in the United States.

Examines the intersectionality of ableism, race, and gender through an exploration of the wage gap by examining key features of graphs.

Data from the GLSEN School Climate Report to create matrix multiplication.

Download Lesson resources

Mary Candace Raygoza

Samantha Fletcher and Holly Anthony

Travis Welland and Lisa Poling

Stacy R. Jones, Carlos Nicolas Gomez, Hilary Tanck, and Eric Sly

Shakiyya Bland

Bryan Meyer and John W. Staley
Part III: Next Steps

Chapters

9. Advice From the Field

10. Creating Social Justice Mathematics Lessons for Your Own Classroom

Creating Your Own Lessons
1. Learn about relevant social injustices
2. Identify the mathematics
3. Establish your goals
4. Determine how you will assess your goals
5. Create a social justice question for the lesson
6. Design the student resources for the investigation
7. Plan for reflection and action
**TEACHING TOLERANCE**

**SOCIAL JUSTICE STANDARDS**
THE TEACHING TOLERANCE ANTI-BIAS FRAMEWORK

[https://www.tolerance.org/sites/default/files/2017-06/TT_Social_Justice_Standards_0.pdf](https://www.tolerance.org/sites/default/files/2017-06/TT_Social_Justice_Standards_0.pdf)

**FOSTERING CIVIL DISCOURSE**
A GUIDE FOR CLASSROOM CONVERSATIONS

[https://www.facinghistory.org/sites/default/files/publications/Fostering_Civil_Discourse.pdf](https://www.facinghistory.org/sites/default/files/publications/Fostering_Civil_Discourse.pdf)
Mathematics Education Through the Lens of Social Justice: Acknowledgment, Actions, and Accountability

A joint position statement from the National Council of Supervisors of Mathematics and TODOS: Mathematics for ALL

Our Position

The National Council of Supervisors of Mathematics (NCSM) and TODOS: Mathematics for ALL (TODOS) trust social justice as a priority in the access to, engagement with, and advancement in mathematics education for our nation’s youth. A social justice stance requires a systemic approach that includes fair and equitable teaching practices, high expectations for students, access to rigorous, relevant mathematics and strong family/community relationships to promote positive mathematics learning and achievement. Equally important, a social justice stance interrogates and challenges the roles power, privilege, and oppression play in the current unjust system of mathematics education—and in society as a whole.

NCSM and TODOS understand that moving forward with social justice demands change in institutional structures, teaching-learning environments, community engagement practices, and individual actions. Incremental approaches to address unjust calls for action have made little difference in how many children experience mathematics in our nation’s schools. This is especially documented by disparities in learning opportunities and outcomes in mathematics education based on race, class, culture, language, and gender. Immediate and transformative change is necessary. These changes must occur in a variety of settings and at multiple levels including classrooms, district offices, school boards, universities, legislatures, and communities.

These changes are needed for a just, equitable, and sustainable system of mathematics education for all children. There must be acknowledgment of the unjust system of mathematics education, to structures and forms of institutional oppression, and the work needed to end it. The actions must be driven by commitments to reframe, reexamine, intervene, and transform mathematics education policies and practices that do not serve to promote fair and just mathematics learning and learning.


TODOS: MATHEMATICS FOR ALL

The mission of TODOS: Mathematics for ALL is to advocate for equity and high-quality mathematics education for all students — in particular, Latina/o students.

The Mo(ve)ment to Prioritize Antiracist Mathematics: Planning for This and Every School Year

“There are only two choices: racist or antiracist.”
- Ibram X. Kendi

Parents as Partners in Mathematics Education
A COMMENTARY SUPPORTING THE TODOS: MATHEMATICS FOR ALL POSITION PAPER MOVEMENT TO PRIORITIZE ANTI-RACIST MATHEMATICS

Student and Family-Centered Mathematics Assessment
A COMMENTARY SUPPORTING THE TODOS: MATHEMATICS FOR ALL POSITION PAPER MOVEMENT TO PRIORITIZE ANTI-RACIST MATHEMATICS

Centering Our Humanity: Addressing Social and Emotional Needs in Schools and Mathematics Classrooms
A COMMENTARY SUPPORTING THE TODOS: MATHEMATICS FOR ALL POSITION PAPER MOVEMENT TO PRIORITIZE ANTI-RACIST MATHEMATICS

Equity Considerations of Access, Use, and Design of Technologies for Teaching Mathematics
A COMMENTARY SUPPORTING THE TODOS: MATHEMATICS FOR ALL POSITION PAPER MOVEMENT TO PRIORITIZE ANTI-RACIST MATHEMATICS


https://www.todos-math.org/statements

https://www.todos-math.org/statements
Teaching Math for Social Justice (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. (p. 23)
“Building on our ideas of social justice; society’s responsibility to ensure equal rights, opportunity and treatment; and the responsibility to respond; we see that teaching mathematics for social justice is about teachers emphasizing equitable opportunities for each and every student, as well has developing an orientation toward using mathematics to enact decision-making power.”
Metro College Success Program: San Francisco

Lori Beth Way, Ph. D., Dean, Division of Undergraduate Education and Academic Planning, San Francisco State University

Savita Malik, Ed. D., Director of Curriculum and Faculty Development, Metro College Success Program, San Francisco State University

Ramona I. Coates, Ph.D., Lecturer & Co-Creator of Statistics for Social Justice Metro College Success Program, San Francisco State University
Statistics for Social Justice
Dr. Lori Beth Way, Dr. Savita Malik and Dr. Ramona Coates
November 17th, 2020
The History

- Evidence of how quantitative reasoning courses were serving students
- Evidence of how Metro was serving students
- Providing resources for innovation
- Convergence of approaches
The Planning

- Cross sector collaborations (HS, CC and CSU)
- Met math standards—a matter of equity
- Class architects are current teachers
- Goal: Teach statistics, through a relevant, social justice lens
The Magic

- Using real-life data sets
- PSA assignment
- Low stakes exams and quizzes (alternative forms of assessment)
- Article assignment submission with multiple platform options
The impact of covid-19 on Latinos in San Francisco

By: Nohemi R.

At this time, the most common problem in the whole world is COVID-19. It is a pandemic that has caused many deaths in the world, and the bad thing is that it will continue to affect until there is no vaccine. In the United States, the population most affected is people of color, undocumented, and low income. I will focus on the Latino population because they may apply to these 3 categories.

In San Francisco California, according to the DataSF website the detected cases of Latinos who tested positive for COVID-19 are 43.7 percent. That's why organizations and health programs came together to do tests on the Mission. They collect data, provide and promote testing, and help those affected.

In the preliminary results of the Latino Task Force by Zoom on May 18, the following data was presented: 4,160 tests were performed at the mission, and of these tests 2.1 percent tested positive. 1.4 percent were residents of the area, and 6.1 percent worked in the area. 47 percent of 2.1 had no symptoms of COVID-19.

Those of us who work in the community know why this population is being affected, but to support this idea we need data. In this zoom meeting, they talked about the economic disadvantage that Latinos have, many have jobs in which they must go to work. More than three families sometimes live in an apartment, and the virus spreads faster, etc. These possible data can help create new resources for the most vulnerable populations or modify those that are being used. Organizations may know what works best for Latinos, and sometimes it is not possible to prevent the spread of the virus because some populations are disadvantaged. However, with more data like these we can find more possible solutions and demand better policies that help people of color, immigrants, and low-income communities.

Works Cited
COVID-19 Data and Reports- Demographics, https://data.sfgov.org/stories/s/w6za-6st8
POLICE BRUTALITY/ VIOLENCE

Somalyta D., Emilia L., Frida R. & Jacquelyn S.
SMART ENOUGH TO GET IT~STATISTICS!
Questions?

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Social Justice Math In The Classroom

Mele Sato, M.Ed., Mathematics Instructor, High Tech High Media Arts, San Diego
What does it take to be a social justice math activist?

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What does it take to be a social justice math activist?

What am I missing and not noticing about my own community?

How can I start to listen to my students more often and learn from them about the injustices they have observed?

How can mathematics be a vehicle for social change and empower students to act on inequities and injustices they observe in our world?
MATHEMATICS IS NOT JUST A TOOL FOR UNDERSTANDING AND INTERPRETING

IT IS ALSO A TOOL FOR INFLUENCING AND CHANGING SOCIETY
WITH, not FOR

Shifting mindset is hard. And it involves a lot of listening.

Social justice mathematics is a means to address the significance of mathematics in our lives and those of others, which directly impacts student identity.

Math teachers so rarely allow themselves to not be the expert. However, it is often in these moments when students are empowered to learn math.
San Diego Police Dept Stop Rates
San Diego Police Department Stops per 1,000 Population

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>All Stops</th>
<th>Stops Excluding Traffic Violations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>58.4</td>
<td>19.3</td>
</tr>
<tr>
<td>Latinx</td>
<td>123.1</td>
<td>62.7</td>
</tr>
<tr>
<td>Native American</td>
<td>127.3</td>
<td>97.5</td>
</tr>
<tr>
<td>White</td>
<td>130.1</td>
<td>79.1</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>294.0</td>
<td>146.1</td>
</tr>
<tr>
<td>Black</td>
<td>415.3</td>
<td>277.1</td>
</tr>
</tbody>
</table>

San Diego Police Stop Rates by Beat
Source: San Diego PD RIPA Stops Database, 7/1/2018 - 6/30/2019
<table>
<thead>
<tr>
<th>Electioneering Pre-Launch Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>My Identity and Beliefs:</strong></td>
</tr>
<tr>
<td><strong>My Current Understanding of Our Government and Voting:</strong></td>
</tr>
<tr>
<td><strong>So What?</strong></td>
</tr>
<tr>
<td><strong>What do I want to know about our government and voting? What questions do I have?</strong></td>
</tr>
</tbody>
</table>
Write your name on a sticky note and change the color of the sticky. (Make sure someone else isn’t already editing the sticky you choose.) Then, add your answer to the following prompt.

When you think about voting, what 2-3 words come to mind?
What do you notice?

What are you wondering?
“We have a national myth that the racial segregation that still exists in every metropolitan area in this country is created by simply private prejudice, private lending practices, people’s desires to live with others of the same race. This is false.” (Richard Rothstein, Economic Policy Institute)

The work is not over. This map is nearly identical to socio-economic maps of San Diego today (San Diego Housing Federation).
MATHEMATICS IS ABOUT HUMAN CONNECTION

We are all mathematicians.
• Social Justice Mathematics and Science Curricular Resources for K-12 Teachers: https://docs.google.com/document/d/1-VW-nhAuFebzq4jJk66y_r4RXe2MMMLKhf_awxj6Qyg/edit

• Math and Social Justice: A Collaborative MTBoS Site: https://sites.google.com/site/mathandsocialjustice/curriculum-resources


• You can find more resources on our website: https://justequations.org/resource/social-justice-math-in-action-webinar/
THANK YOU
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