JUST EQUATIONS

SOCIAL JUSTICE MATH IN ACTION: FROM EDUCATIONAL MODEL TO EDUCATIONAL MOVEMENT

November 17, 2020

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

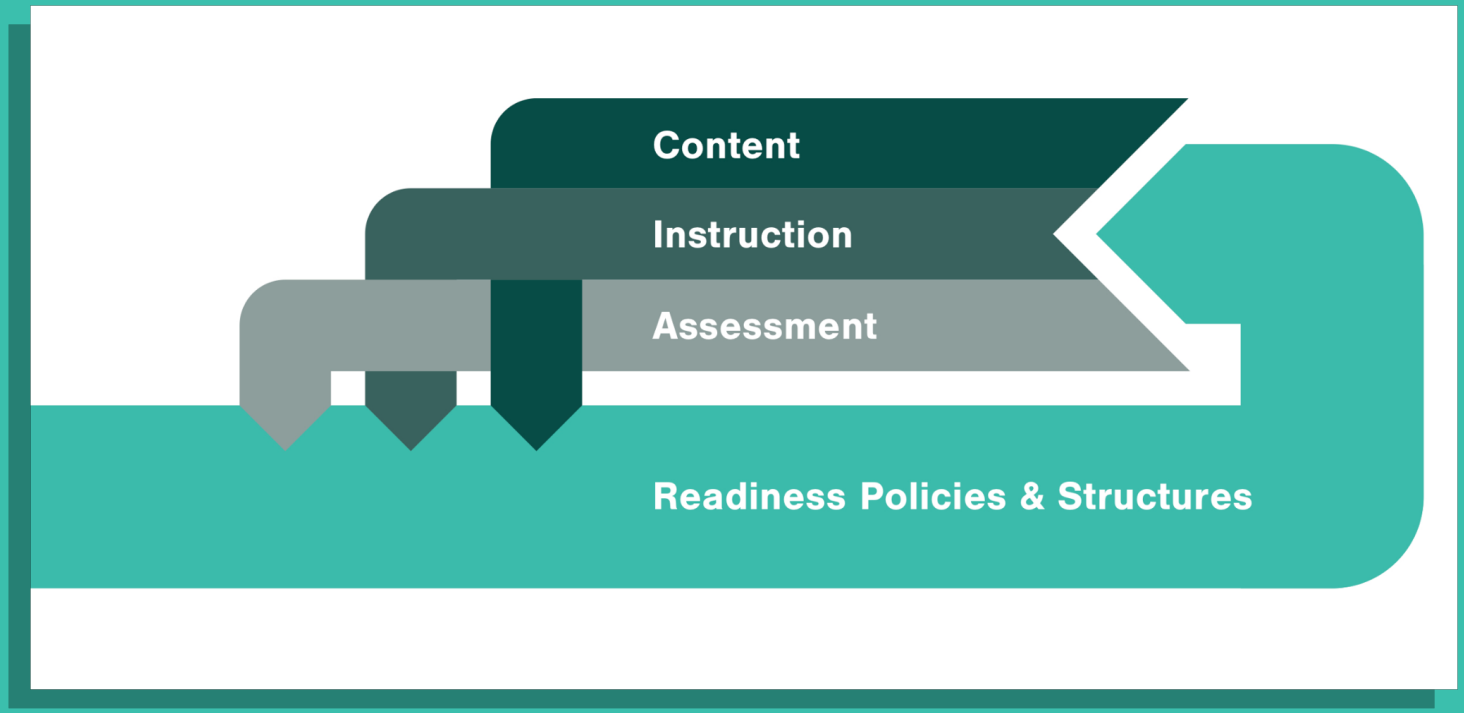
- Introduction: Just Equations and Co-sponsors
- **John W. Staley, Ph. D.** – *High School Mathematics Lessons to Explore, Understand, and Respond to Social Injustice*
- **Lori Beth Way, Ph. D.; Savita Malik, Ed.D.; Ramona I. Coates, Ph.D**. – Metro College Success Program, San Francisco
- **Mele Sato, 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



POLICY GOALS

We work to advance:

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

CO-SPONSORS

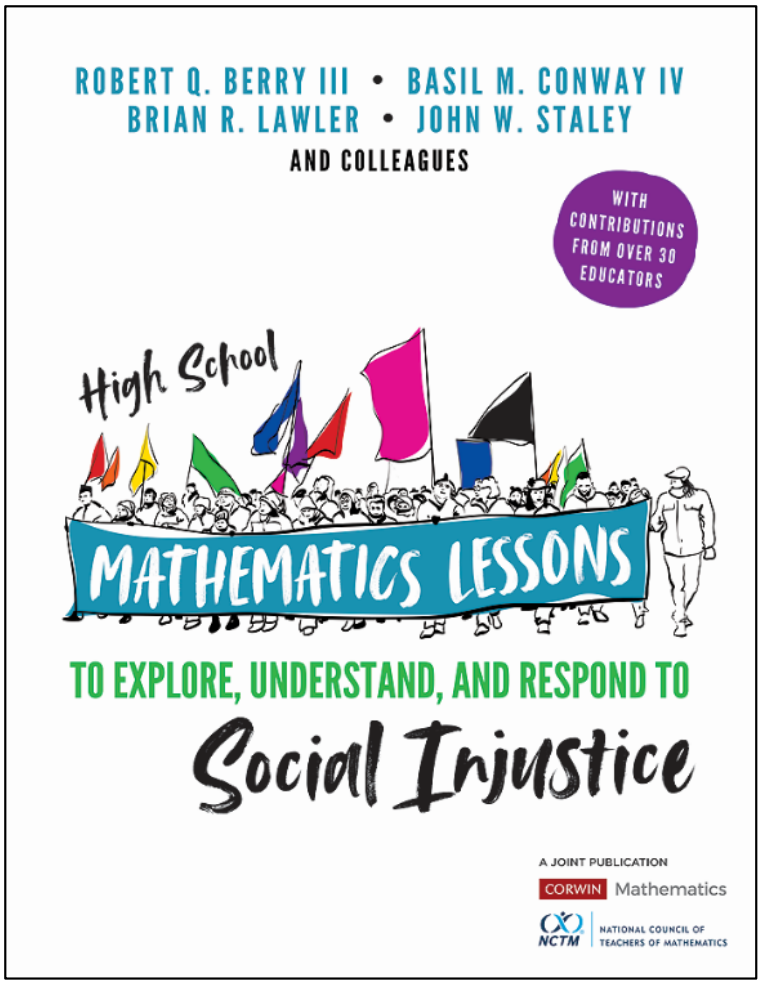
The Education Trust–West

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

Dr. John W. Staley, johnstaley64@gmail.com
@jstaley06
Baltimore County Public Schools
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.

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
3. Instructional Tools for the Social Justice Mathematics Lesson
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

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

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

(p. 23)

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)*

(NCTM Catalyzing Change Series)

Teaching Math for Social Justice (TMSJ)

Picha, 2019. Presentation at NCTM, San Diego

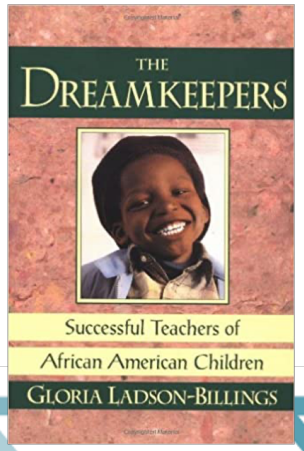
- Status differences may result in students having less access to interaction
- Create multidimensional classroom, where every student is recognized to have mathematical ability
- *Cohen & Lotan* and *Horn*

- 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*

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

- 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*



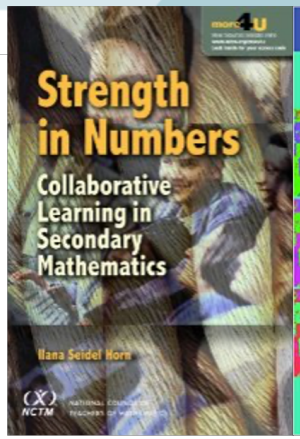
Standards-Based Math Instruction (SBMI)

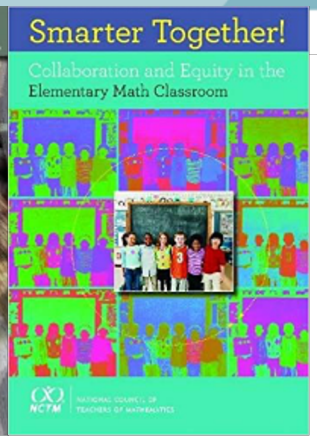
Complex Instruction (CI)

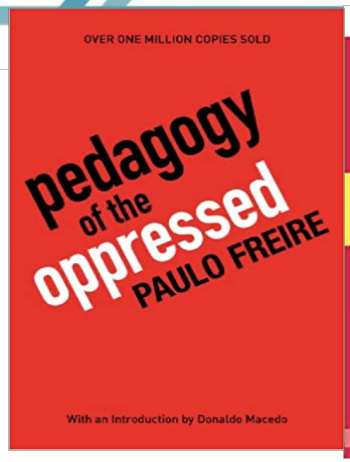
Culturally Relevant Pedagogy (CRP)

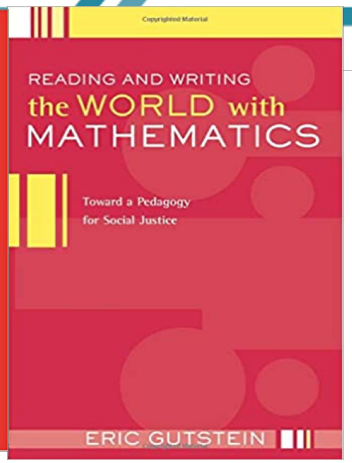
Critical Math Education (CME)

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

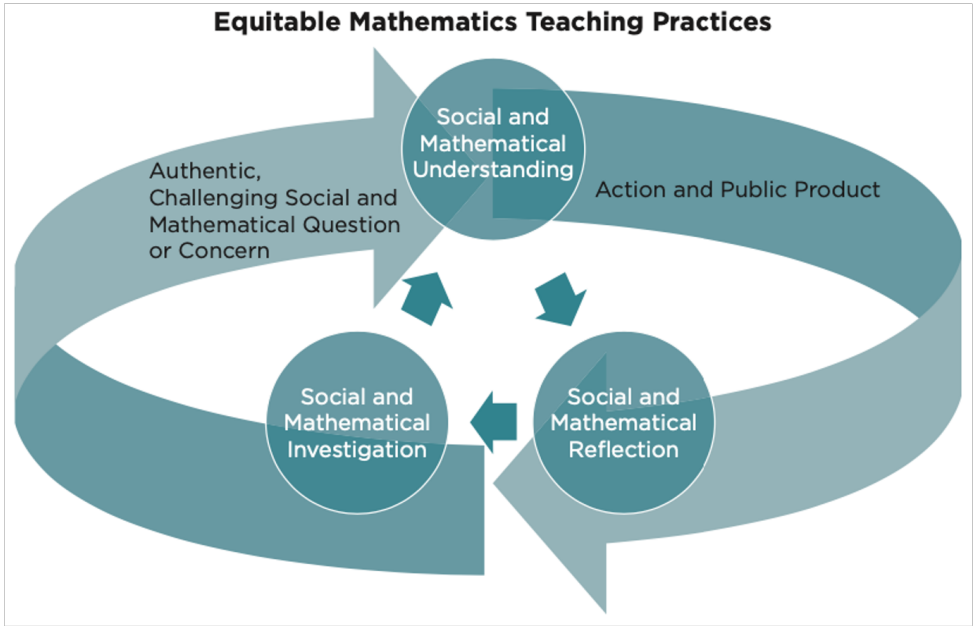
When

- 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

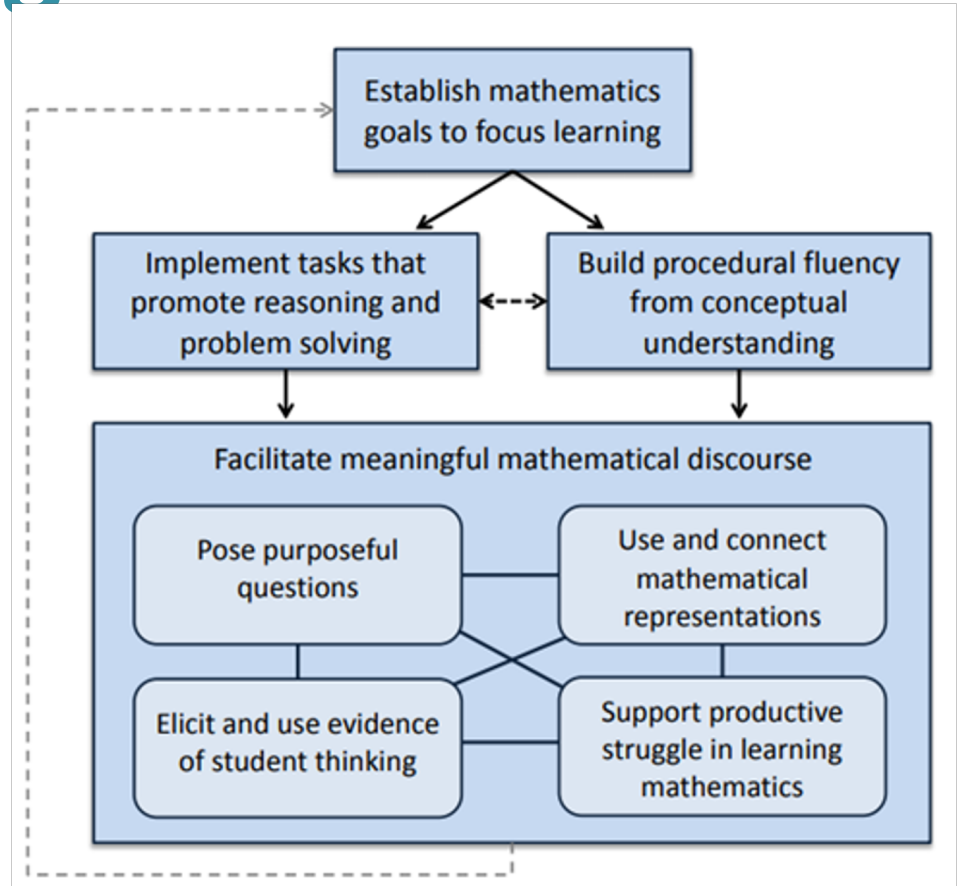


Elements of a SJML Framework

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

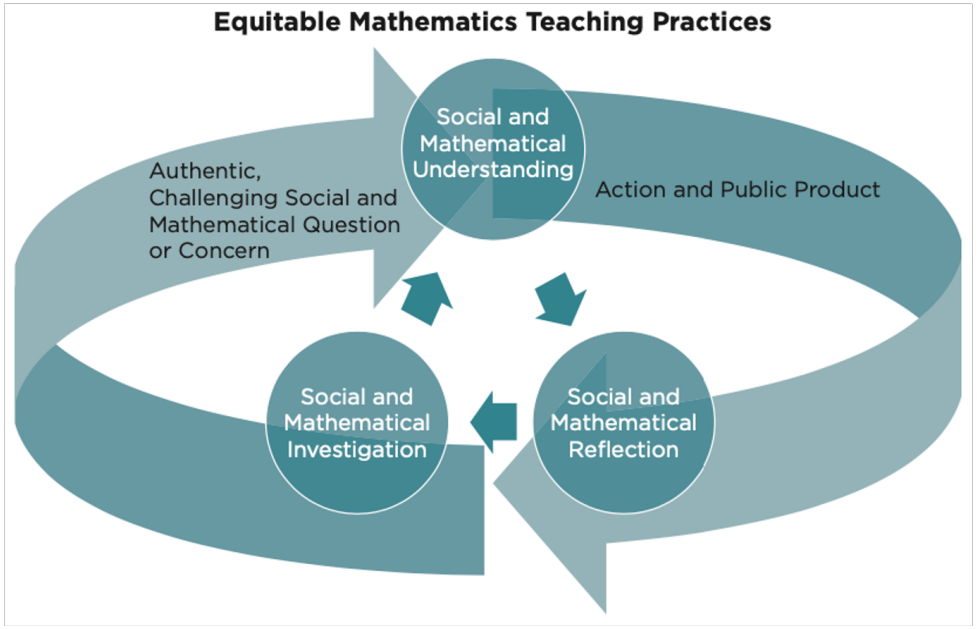
- Going deep with mathematics
- Leveraging multiple mathematical competencies
- Affirming mathematics learners' identities
- Challenging spaces of marginality
- Drawing on multiple resources of knowledge



NCTM, *Taking Action* series and *Principles to Action*

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

Social Justice Mathematics Lesson Framework



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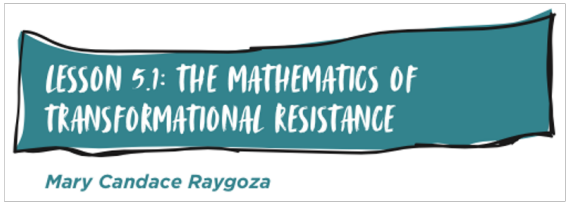
Part II: Social Justice Mathematics Lessons

Chapters

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

22 Lessons
30+ Educators

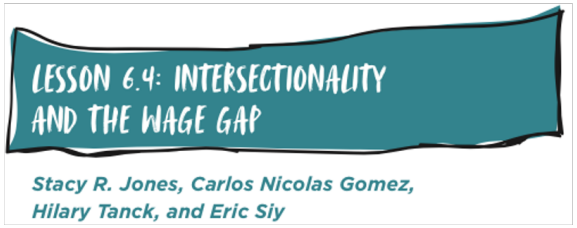


Meaning for the coordinate plane through Solórzano and Delgado Bernal's (2001) **four "quadrants"** of resistance.

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

Triangle centers to examine and rectify lack of access to healthy food.

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



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

Part III: Next Steps

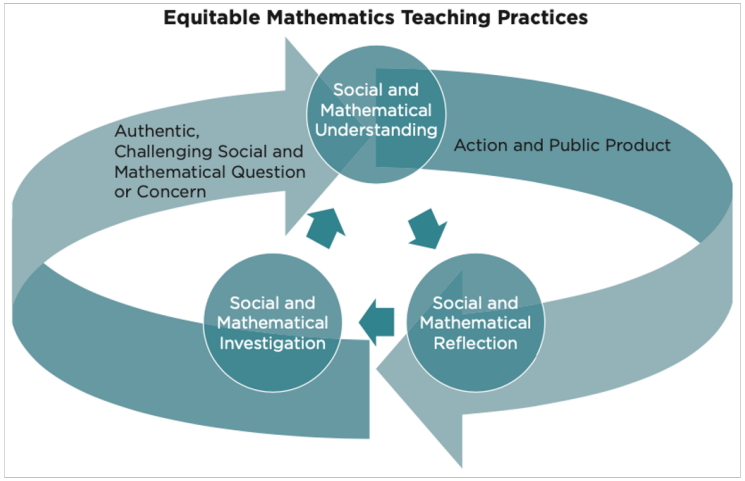
Chapters

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

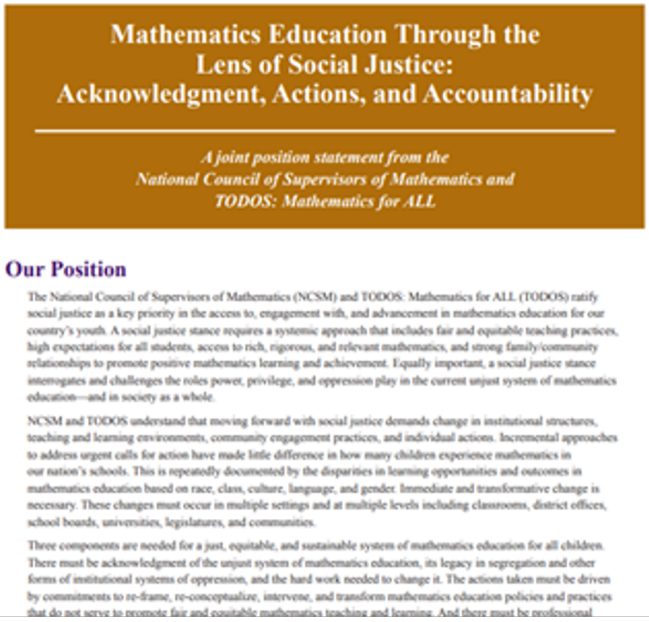
FACING HISTORY AND OURSELVES

People make choices. Choices make history.

FOSTERING CIVIL DISCOURSE

A GUIDE FOR CLASSROOM CONVERSATIONS

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

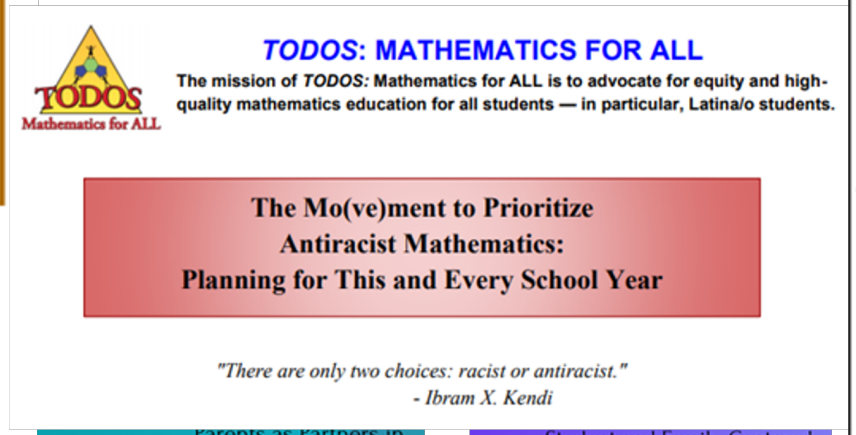
Our Position

The National Council of Supervisors of Mathematics (NCSM) and TODOS: Mathematics for ALL (TODOS) ratify social justice as a key priority in the access to, engagement with, and advancement in mathematics education for our country's youth. A social justice stance requires a systemic approach that includes fair and equitable teaching practices, high expectations for all students, access to rich, rigorous, and 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 and learning environments, community engagement practices, and individual actions. Incremental approaches to address urgent calls for action have made little difference in how many children experience mathematics in our nation's schools. This is repeatedly documented by the 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 multiple settings and at multiple levels including classrooms, district offices, school boards, universities, legislatures, and communities.

Three components 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, its legacy in segregation and other forms of institutional systems of oppression, and the hard work needed to change it. The actions taken must be driven by commitments to re-frame, re-conceptualize, intervene, and transform mathematics education policies and practices that do not serve to promote fair and equitable mathematics teaching and learning. And there must be professional

https://www.mathedleadership.org/docs/resources/positionpapers/NCSMPositionPaper16.pdf

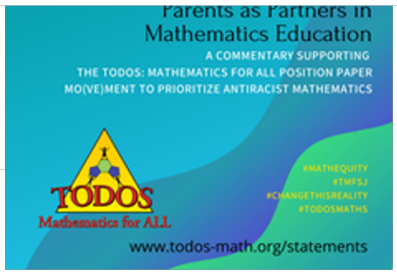


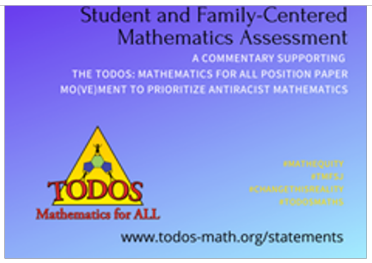
TODOS: MATHEMATICS FOR ALL

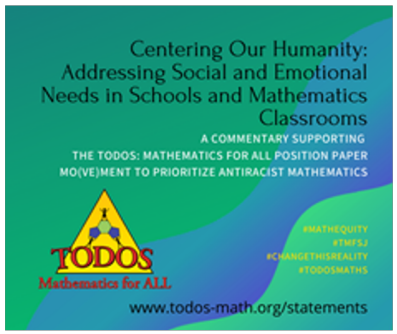
The mission of *TODOS:* Mathematics for ALL is to advocate for equity and high-quality mathematics education for all students — in particular, Latina/o students.

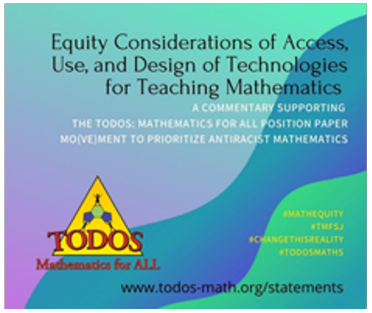
The Mo(ve)ment to Prioritize Antiracist Mathematics: Planning for This and Every School Year

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

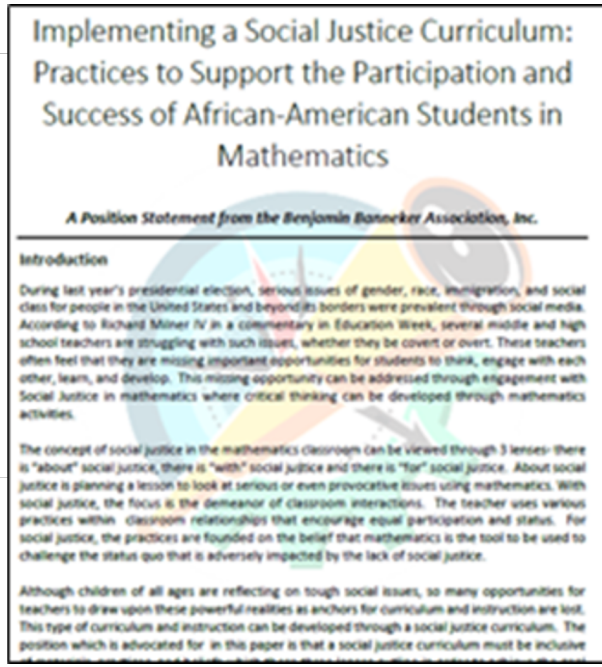








https://www.todos-math.org/statements



Implementing a Social Justice Curriculum: Practices to Support the Participation and Success of African-American Students in Mathematics

A Position Statement from the Benjamin Banneker Association, Inc.

Introduction

During last year's presidential election, serious issues of gender, race, immigration, and social class for people in the United States and beyond its borders were prevalent through social media. According to Richard Milner IV in a commentary in Education Week, several middle and high school teachers are struggling with such issues, whether they be covert or overt. These teachers often feel that they are missing important opportunities for students to think, engage with each other, learn, and develop. This missing opportunity can be addressed through engagement with Social Justice in mathematics where critical thinking can be developed through mathematics activities.

The concept of social justice in the mathematics classroom can be viewed through 3 lenses- there is "about" social justice, there is "with" social justice and there is "for" social justice. About social justice is planning a lesson to look at serious or even provocative issues using mathematics. With social justice, the focus is the demeanor of classroom interactions. The teacher uses various practices within classroom relationships that encourage equal participation and status. For social justice, the practices are founded on the belief that mathematics is the tool to be used to challenge the status quo that is adversely impacted by the lack of social justice.

Although children of all ages are reflecting on tough social issues, so many opportunities for teachers to draw upon these powerful realities as anchors for curriculum and instruction are lost. This type of curriculum and instruction can be developed through a social justice curriculum. The position which is advocated for in this paper is that a social justice curriculum must be inclusive

http://bbamath.org/wp-content/uploads/2017/11/BBA-Social-Justice-Position-Paper_Final.pdf

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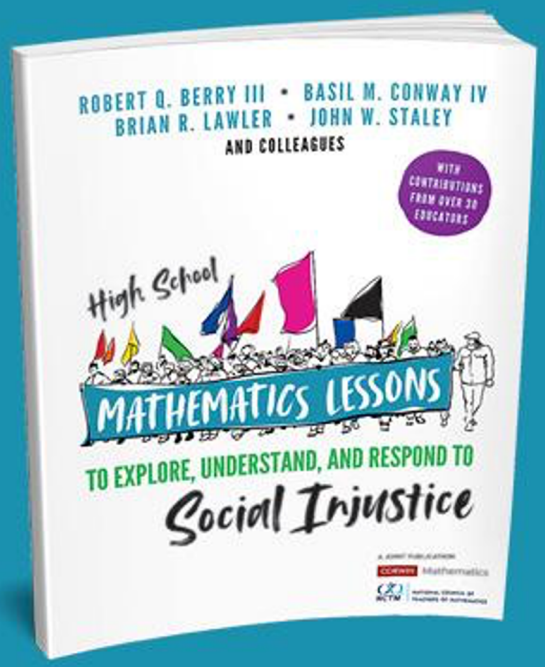


"Building on our ideas of social justice; society's responsibility to ensure equal rights, opportunity and treatment; and the responsibility to respond; we see that teaching mathematics for social justice is about teachers emphasizing equitable opportunities for each and every student, as well has developing an orientation toward using mathematics to enact decision-making power."

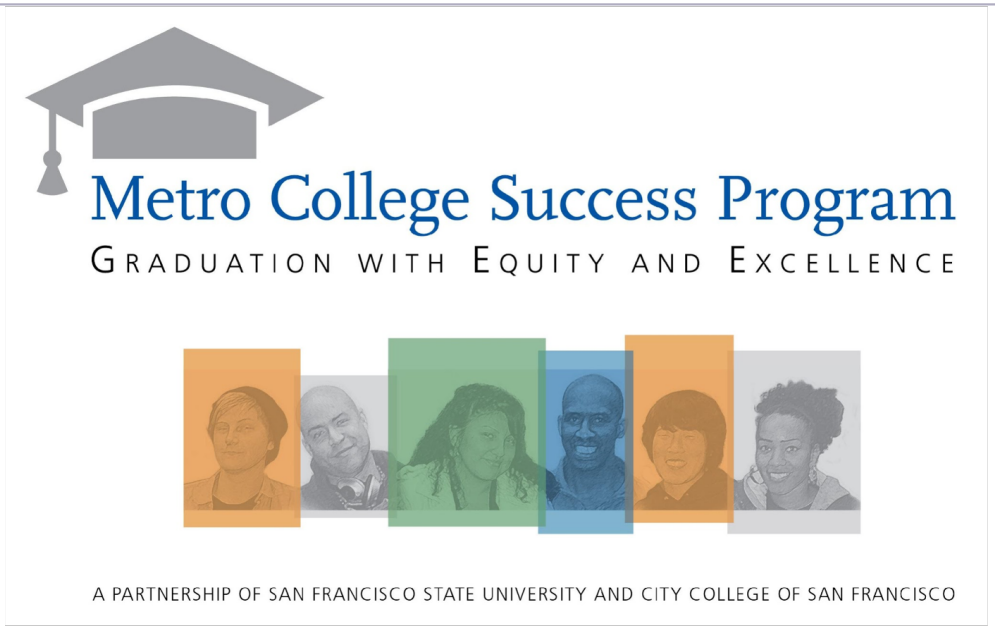
CORWIN Mathematics

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

SF STATE

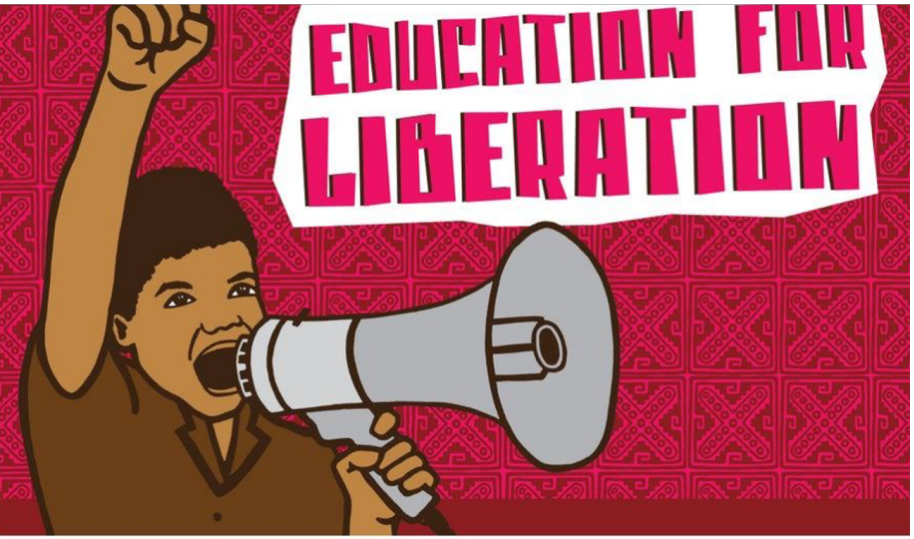
The History

- 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



Graphic credit: Art by Melanie Cervantes

- Using real-life data sets
- PSA assignment
- Low stakes exams and quizzes (alternative forms of assessment)
- Article assignment submission with multiple platform options

SF STATE

The impact of covid-19 on Latinos in San Francisco

By: Nohemi R.

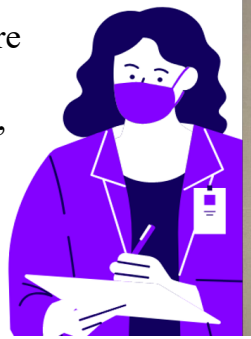
At this time, the most common problem in the whole world is COVID-19. It is a pandemic that has caused many deaths in the world, and the bad thing is that it will continue to affect until there is no vaccine. In the United States, the population most affected is people of color, undocumented, and low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

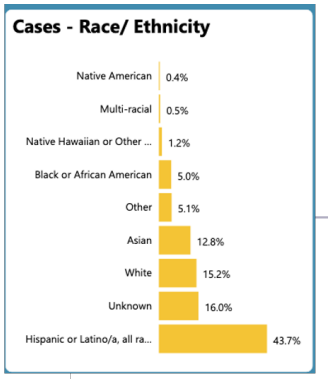
In San Francisco California, according to the DataSF website the detected cases of Latinos who tested positive for COVID-19 are 43.7 percent. That's why organizations and health programs came together to do tests on the Mission. They collect data, provide and promote testing, and help those affected.

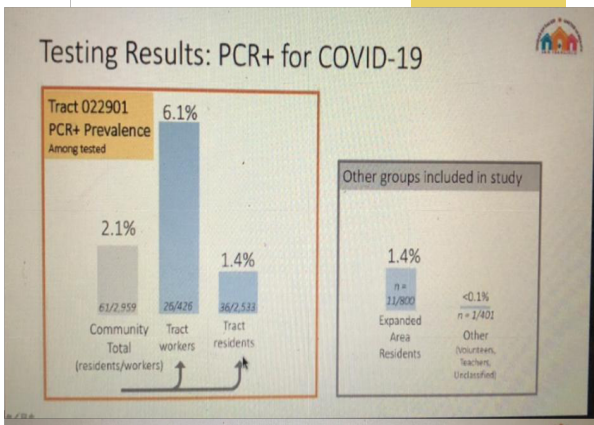
In the preliminary results of the Latino Task Force by Zoom on May 18, the following data was presented: 4,160 tests were performed at the mission, and of these tests 2.1 percent tested positive. 1.4 percent were residents of the area, and 6.1 percent worked in the area. 47 percent of 2.1 had no symptoms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

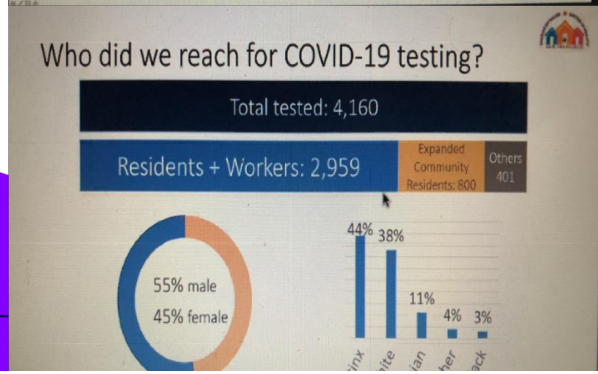
Those of us who work in the community know why this population is being affected, but to support this idea we need data. In this zoom meeting, they talked about the economic disadvantage that Latinos have, many have jobs in which they must go to work. More than three families sometimes live in an apartment, 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

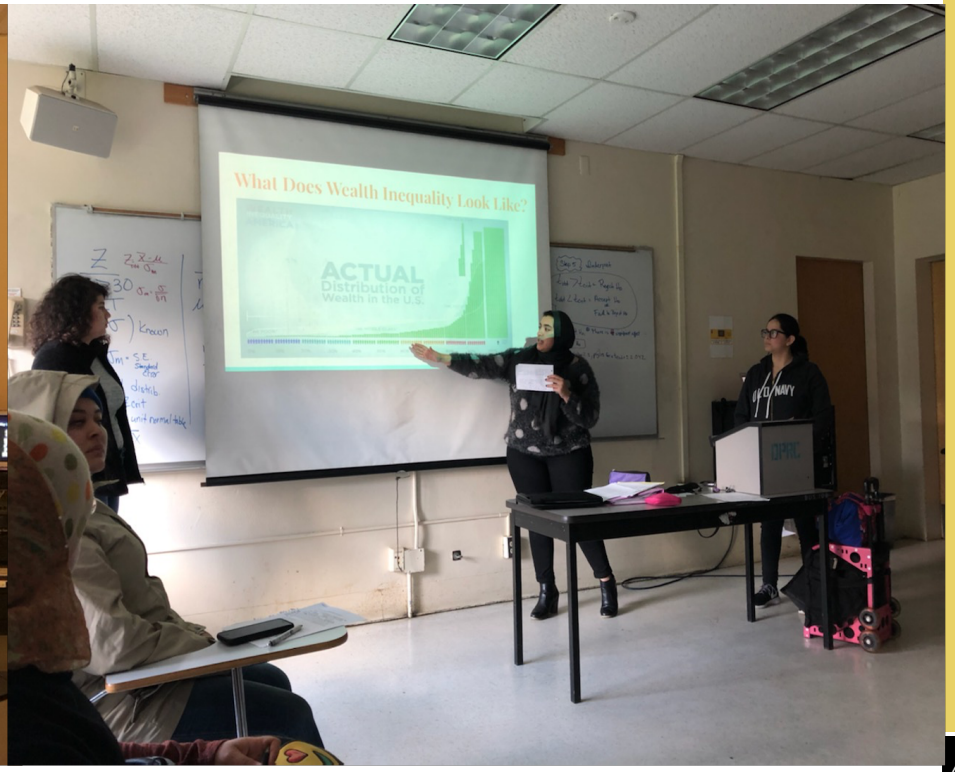





POLICE BRUTALITY/ VIOLENCE

Somalyta D., Emilia L., Frida R. & Jacquelyn S.

SMART ENOUGH TO GET IT~STATISTICS!



SF STATE

Questions?

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SF STATE

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?

Mele Sato
High Tech High Media Arts
msato@hightechhigh.org

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.

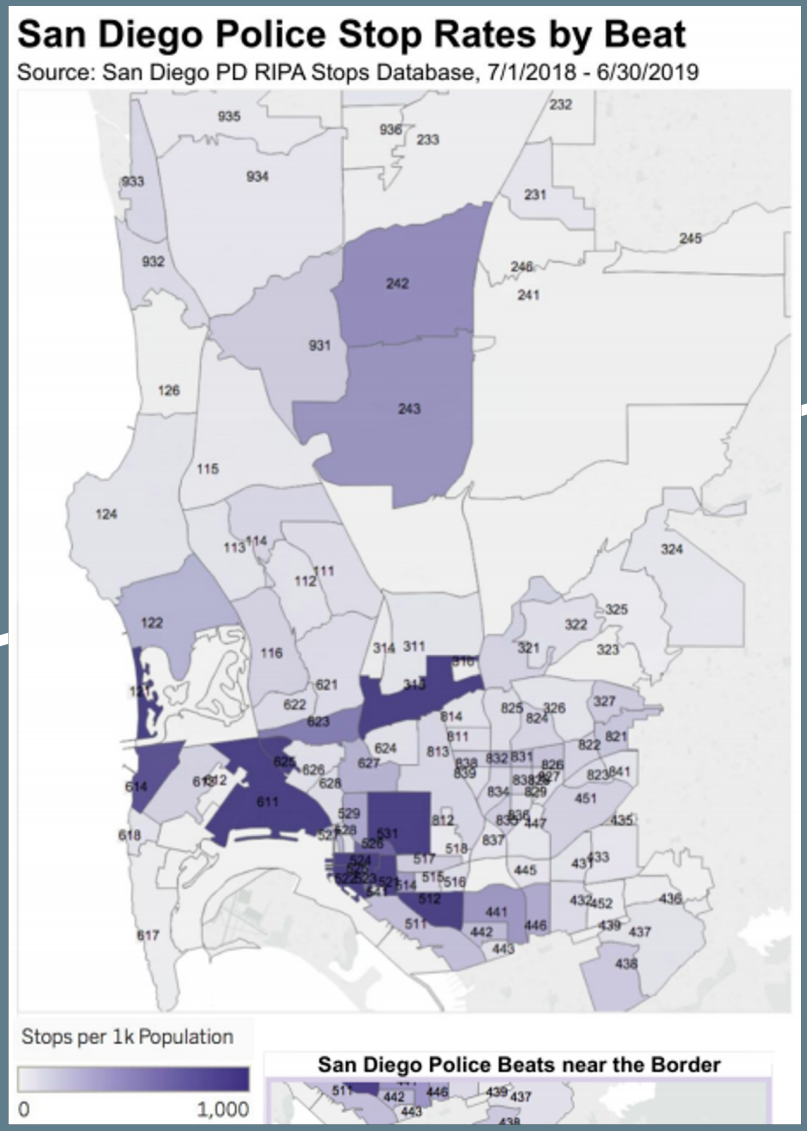
Social justice mathematics is a means to address the significance of mathematics in our lives and those of others, which directly impacts student identity.

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

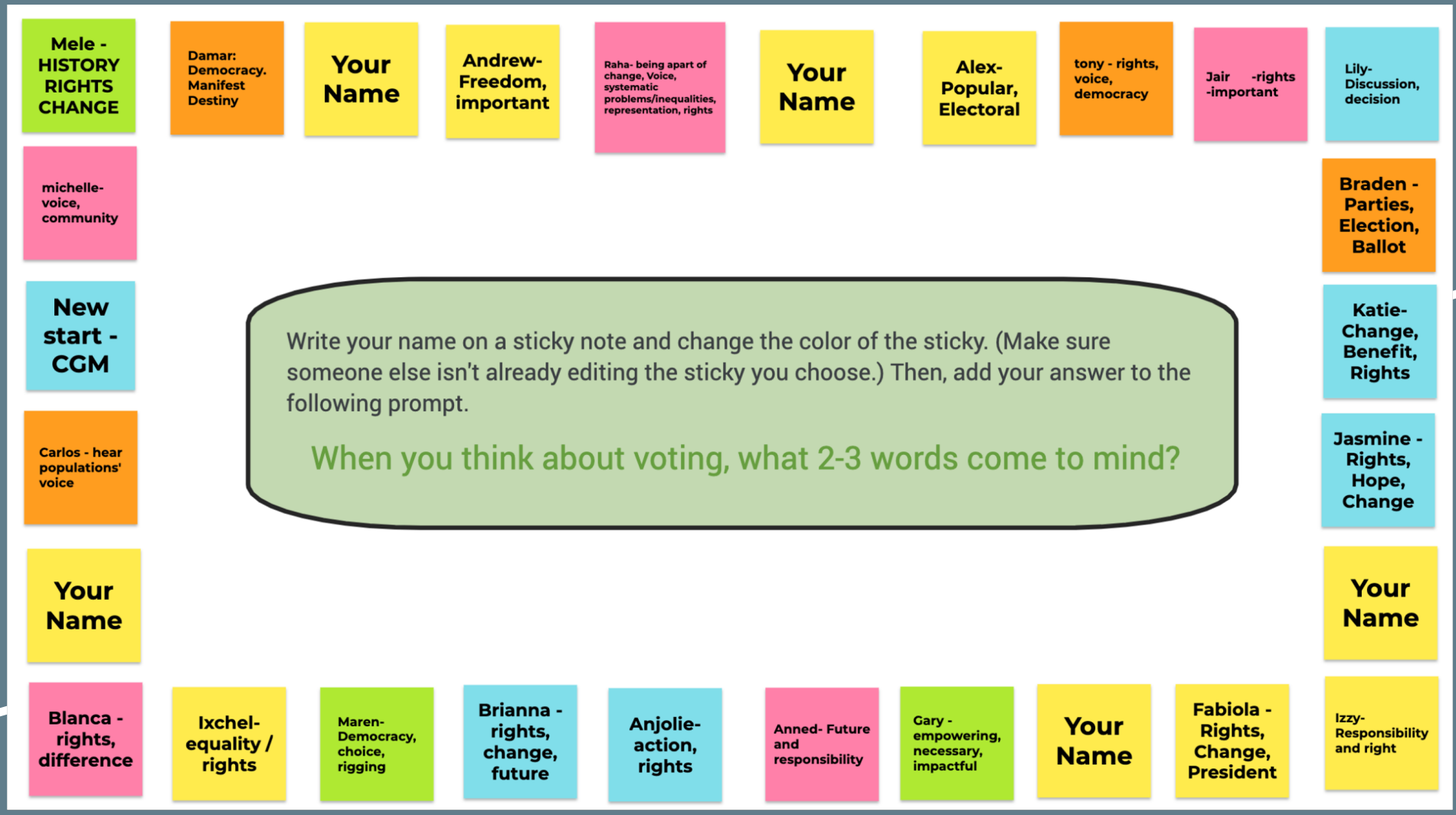
San Diego Police Department Stops per 1,000 Population

	All Stops	Stops Excluding Traffic Violations
Asian	58.4	19.3
Latinx	123.1	62.7
Native American	127.3	97.5
White	130.1	79.1
Pacific Islander	294.0	146.1
Black	415.3	277.1



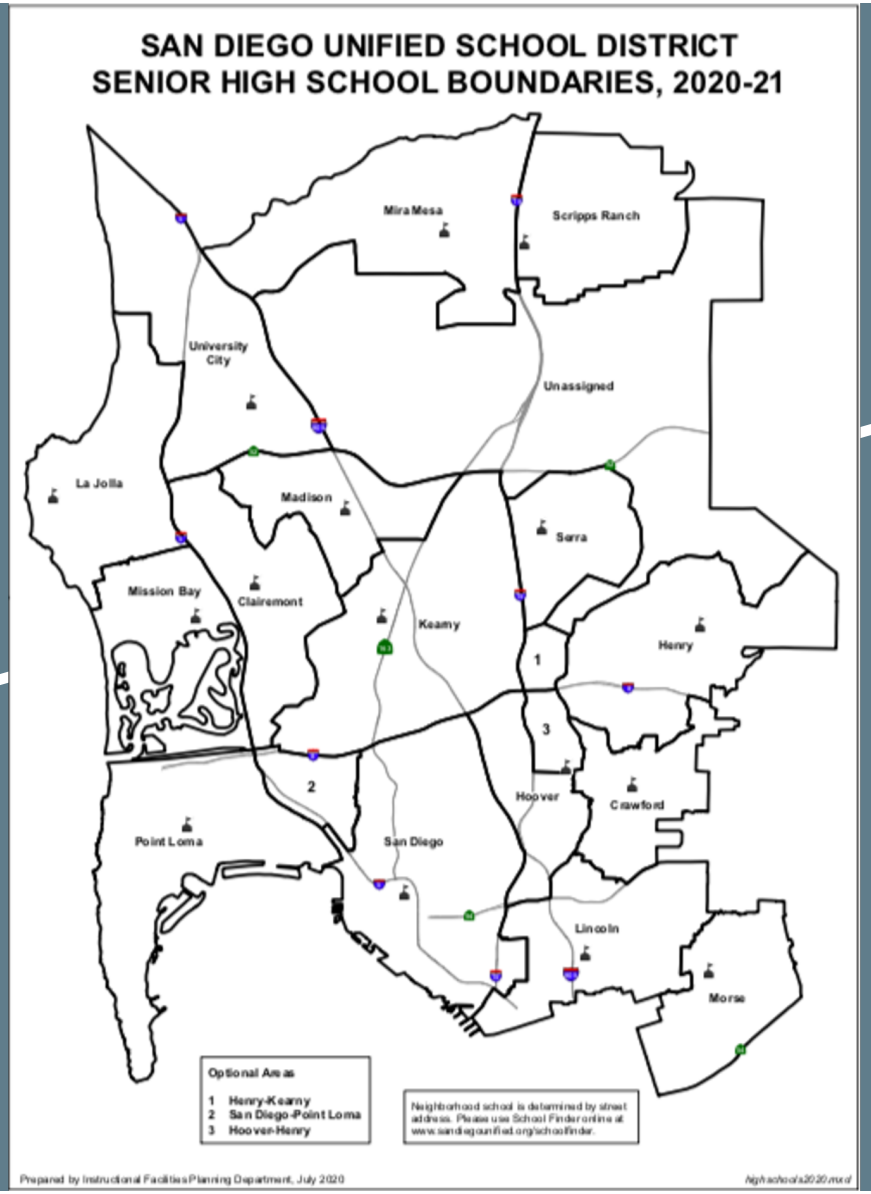
Electioneering Pre-Launch Activity

My Identity and Beliefs:	My Current Understanding of Our Government and Voting:	So What?	What do I want to know about our government and voting? What questions do I have?


Mele - HISTORY RIGHTS CHANGE
Damar: Democracy. Manifest Destiny
Your Name
Andrew- Freedom, important
Raha- being apart of change, Voice, systematic problems/inequalities, representation, rights
Your Name
Alex- Popular, Electoral
tony - rights, voice, democracy
Jair -rights -important
Lily- Discussion, decision
michelle- voice, community
Braden - Parties, Election, Ballot
New start - CGM
Katie- Change, Benefit, Rights
Carlos - hear populations' voice
Jasmine - Rights, Hope, Change
Your Name
Your Name
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?
Blanca - rights, difference
Ixchel- equality / rights
Maren- Democracy, choice, rigging
Brianna - rights, change, future
Anjolie- action, rights
Anned- Future and responsibility
Gary - empowering, necessary, impactful
Your Name
Fabiola - Rights, Change, President
Izzy- Responsibility and right

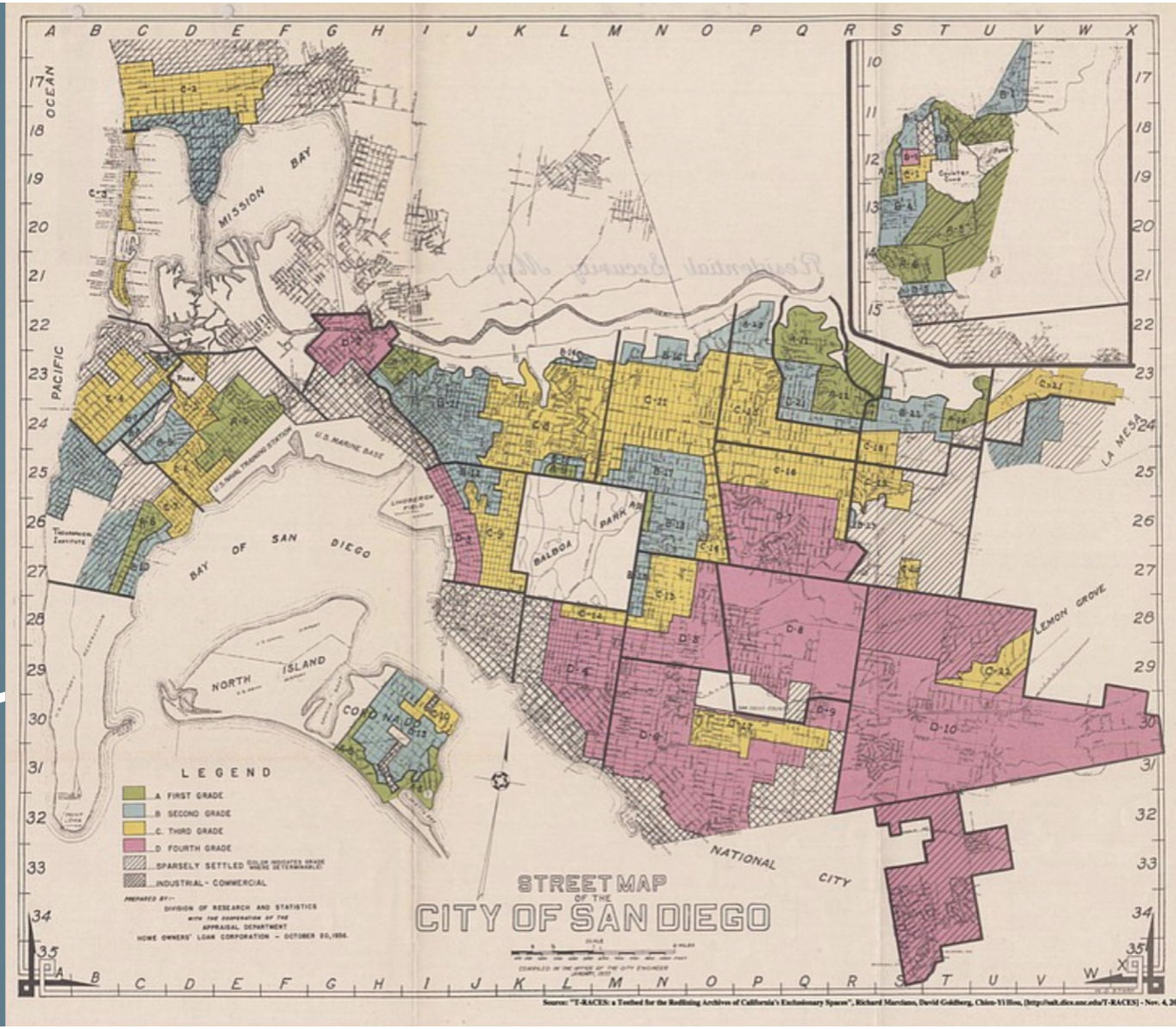
What do you notice?

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.

RESOURCES

- 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
- Downloadable Lesson Plans: http://www.radicalmath.org/main.php?id=SocialJusticeMath
- You can find more resources on our website: https://justequations.org/resource/social-justice-math-in-action-webinar/

THANK YOU

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