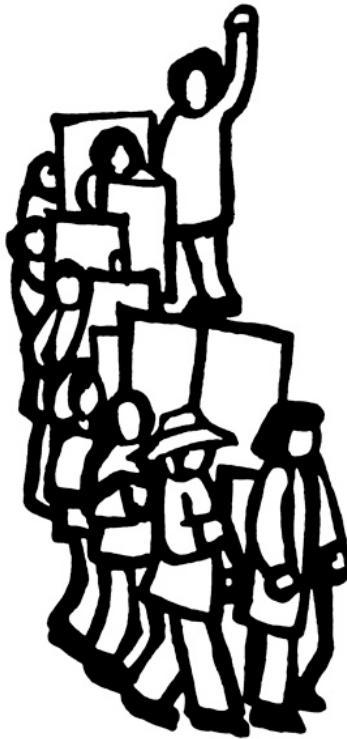


A GUIDE FOR INTEGRATING ISSUES OF **SOCIAL** AND **ECONOMIC JUSTICE** INTO MATHEMATICS CURRICULUM*

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INTRODUCTION

Mathematical literacy has long been a gatekeeper to higher learning opportunities due to the prevalence of high school exit exams, SAT tests, and college placement exams. Math attainment has also been related to overall educational attainment and subsequent economic mobility. Finishing a math course beyond Algebra II more than doubles the odds that a student will get a Bachelor's Degree,¹ and in 2005 the median income of someone with a Bachelor's Degree was nearly twice that of someone with a high school diploma.² This becomes particularly relevant for educators in urban school systems such as New York City, where 64.8% of the students are eligible for free lunch and 85.7% are students of color³ and in Los Angeles where only 56% of African American students are graduating from high school.⁴

In addition, the systemic and structural oppression of low income and people of color in the United States is worsening. The number of people in prison continues to grow⁵, as do unemployment rates⁶. Billions of dollars that were once available for social programs and education have been diverted to pay for war⁷. Rents are skyrocketing, while affordable housing is becoming even scarcer⁸. Over 35 million people lack health insurance⁹.

These problems and many others are being addressed by community organizations and activists, and often find their way into assignments in Social Studies and English classes. However, in math classes around the country, perhaps the best places to study many of these issues, we continue to use curricula and models that lack any real-world, let alone socially relevant, contexts. A great opportunity to educate our young people about understanding and addressing these myriad issues continues to be squandered.

In no way do I consider myself to be an expert in integrating social justice issues into math classes, nor am I the first person to think or write about these issues. There are many wiser and more experienced educators than myself who have been doing this work for much longer than I have been. Anyone interested in the concept of "social justice and mathematics" should consult the writings of scholars whose work has inspired my own, including: Rico Gutstein, Bob Moses, William F. Tate, Danny Bernard Martin, Arthur Powell, Marilyn Frankenstein, Bob Peterson, Gloria Ladson-Billings, Paulo Freire, and Henry Giroux, amongst others.

Jonathan Osler
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¹ U.S. Department of Education, *Answers in the Toolbox: Academic Intensity, Attendance Patterns and Bachelor's Degree Attainment*, 1999

² http://nces.ed.gov/programs/digest/d06/tables/dt06_377.asp?referrer=list

³ <http://schools.nyc.gov/daa/SchoolReports/05asr/9.pdf>

⁴ <http://www.civilrightsproject.ucla.edu/research/dropouts/dropouts05.pdf>

⁵ <http://www.sentencingproject.org/NewsDetails.aspx?NewsID=444>

⁶ <http://www.bls.gov/news.release/empstat.t02.htm>

⁷ <http://www.ombwatch.org/article/articleview/3833/>

⁸ http://www.mortgagenewsdaily.com/8112005_Paycheck_to_Paycheck.asp

⁹ <http://www.cbpp.org/8-29-06health.htm>

WHY MATH EDUCATION AND SOCIAL JUSTICE?

I will let my mentors speak for themselves:

Bob Moses, Civil Rights Activist and Founder of The Algebra Project

“Today, I want to argue, the most urgent social issue affecting poor people and people of color is economic access. In today’s world, economic access and full citizenship depend crucially on math and science literacy.”¹⁰

Jean Anyon, Professor of Urban Education at the Graduate Center of the City University of New York

“I believe it is important for educators, public policy analysts, and practitioners to take hold of the fact that economic policies yield widespread low-wage work even among an increasingly educated workforce... Unless we make some changes in the way the macro-economy works, economic policy will trump not only urban school reform, but individual educational achievement of urban students as well.”¹¹

Ubiratan D’Ambrosio, Brazilian Educator and ‘Father’ of Ethnomathematics

“It is important to show students the presence of math in a world of techno-science, but also to reassure students of their culture roots and show them there is a dynamic in the evolution of mathematical knowledge to which all people – not just the “heroes” - are recognized in the traditional histories of mathematics.”¹²

Paulo Freire, world-renowned education scholar and author

“The educators of this country have much besides content to teach to boys and girls, no matter from what social class they come. They have much to teach through the example of fighting for the fundamental changes we need, of fighting against authoritarianism and for democracy... Our job requires dedication to overcoming social injustice.”¹³

¹⁰ Moses, Bob, “Radical Equations: Math Literacy and Civil Rights”, pg. 5

¹¹ Anyon, Jean, “Radical Possibilities: Public Policy, Urban Education, and a New Social Movement”, pg. 29

¹² D’Ambrosio, Ubiratan, “Mathematics as Crucial and Timely for Shaping a New Civilization,” Talk at NCTM National Conference, April 2006

¹³ Freire, Paulo, “Teachers as Cultural Workers: Lessons to Those Who Dare Teach”, pg. 58

WHAT IS “SOCIAL JUSTICE MATH” (SJM)?

There is no definition of what “Social Justice Math” is or isn’t. However, in my opinion, SJM has at least two, related components:

MATH EDUCATION & SOCIAL JUSTICE	
Math Literacy as a Civil Right/ Social Justice Issue	Studying Issues of Social and Economic Justice in the Math Classroom
<ul style="list-style-type: none">Lessons and activities that increase students’: math literacy; problem solving, reasoning and critical thinking abilities; ability to apply knowledge and skills; sense of themselves as mathematicians; knowledge of the math in their own culture; ownership of learning process; preparedness for math-based college majors and careers; etc.	<ul style="list-style-type: none">Understanding issues of social, political, and economic (in)justice through a mathematical frameworkDeveloping realistic, just, and mathematically-sound solutions to address these problems

WHICH SOCIAL JUSTICE ISSUES CAN BE TAUGHT WITHIN A MATHEMATICAL FRAMEWORK?

There is an almost infinite list of important, relevant issues that can be covered in a math class. A partial list includes:

Political, Economic, and Social Issues:

- Prisons, racial profiling, the death penalty
- Poverty, minimum vs. living wage, sweatshops
- Housing, gentrification, homeownership
- War, defense budgets, military recruiting
- Public health, AIDS, asthma, health insurance
- Educational funding and equity, high stakes testing, class size
- Environmental racism, pollution, resource availability

Financial Education

- Credit cards, managing debt, paying for college
- Saving/budgeting money, opening bank accounts
- High-cost loans (rent-to-own stores, check cashers, refund-anticipatory loans, payday, etc.)
- Filing taxes
- Remittance rates

WHAT ARE THE BENEFITS OF INTEGRATING SOCIAL JUSTICE ISSUES INTO MATHEMATICS CURRICULUM?

Students can...¹⁴

- Recognize the power of mathematics as an essential analytical tool to understand and potentially change the world, rather than merely regard math as a collection of disconnected rules to be memorized and regurgitated.
- Deepen their understanding of local, national, and global issues
- Engage in high-level thinking about “Big Mathematical Ideas”
- Become more motivated to learn math
- Participate in actual (not just theoretical) community service projects and organizing campaigns
- Answer this question for themselves: “Why do I have to know this?”
- Develop critical thinking and problem-solving skills

Teachers can...

- Differentiate their curriculum
- Create interdisciplinary curriculum and partnerships outside of the school
- Learn about their students lives and the communities they teach in
- Assess learning in a contextualized, holistic manner
- Increase students’ math literacy
- More easily engage students in class

WHO SHOULD BE STUDYING MATH WITHIN A SOCIAL JUSTICE FRAMEWORK?

No matter the experiences, advantages, struggles, neighborhood, race, class, and gender of your students, learning math within a social justice framework is important for their understanding of both the math concepts and of their opportunities to be agents of change.

¹⁴ Gutstein, Eric and Bob Peterson, “Rethinking Mathematics: Teaching Social Justice by the Numbers”, Rethinking Schools, 2005

WHAT ARE THE PITFALLS AND CHALLENGES OF INTEGRATING ISSUES OF SOCIAL JUSTICE INTO MATHEMATICS CURRICULUM?

- **NCLB, standardized tests, and mandated curriculum.**

Teachers who are pressured to teach towards an exam, or to teach from a textbook that their school district has chosen, find it difficult to try anything non-traditional in their classrooms for fear of reprisal from their administration and concern that their students won't pass high-stakes tests.

- **Good math doesn't mean good politics**

There are some textbooks and popular curricula that are useful for teaching young people mathematics. Many of these texts even use real-world contexts for instruction. However, very few of them are relevant to our young people, and they don't have students investigate issues of social justice. Talking about a jar of Jelly Beans can be a fun way to learn about probability. But studying probability in the context of a unit on how the Lottery increases the economic divide between rich and poor will allow the class to cover the same mathematical content while simultaneously investigating an important issue of economic inequality.

- **Good politics doesn't mean good math**

Many people often make the mistake of thinking that just because we are talking about important and relevant issues, that there is good teaching and learning going on in our classrooms. Unless the math content itself is strong, even the most provocative conversations and lessons are actually doing students a disservice. It is an act of social *in*-justice to deny young people the opportunity to master the math that they are in your class to learn.

- **The risk of disempowering students**

Talking about inequality, racism, sexism, poverty, etc., can be overwhelming for anyone, especially young people. It can be disempowering for those who know these realities first hand, just as it can be disempowering for those whose families, relatives, neighbors, etc., are in part responsible for perpetuating and exacerbating these problems. Make sure your students know that they are not to blame (as victims nor perpetrators) for these systemic problems.

AN OVERVIEW OF HOW TO INTEGRATE ISSUES OF SOCIAL JUSTICE INTO YOUR MATH CLASS

Whenever possible...

- **Have student-driven questions**

Create your lesson/unit around issues and questions that students have created and are interested in learning about.

- **Have a solution-based component**

Don't just raise awareness about the problems in the world. It's not easy, but try to create projects that challenge students to come up with just, mathematically-sound solutions to the problems that they identify.

- **Partner with local organizations**

Break out of the theoretical. Work with an organization in your neighborhood. Do a survey for them. Create maps for them. Provide them with demographic data reports and graphs. Help them design a new building. This will not only produce tangible benefits for your community, but will make any work you do more relevant and meaningful for your students.

- **Have students present and share their work**

They can present to their classmates, other students in the school, administrators, city officials, community members, parents, the media, etc. If your students know they will have to present their work, it will usually encourage them to work harder, will help them develop public speaking skills, and will empower them both an in out of the classroom.

- **Start small**

Don't try to write an entire unit right away. Start with a one or two-day activity. Then go for a week-long project. Remember, Rikers (Island) wasn't built in a day.

- **Work towards complexity**

You need to scaffold students' understandings of both the math concepts and the issues you're studying. Young people have very polarized understanding of social justice issues; they see things as either right or wrong. While questions of fairness and injustice can be good to hook students into a conversation, your goal should be to help them develop a nuanced understanding of the problems that you're studying.

- **Assessment**

Your assessment should allow you to determine what students have learned about the math concepts and about the social justice issues that were in the lesson or unit.

THE SPECIFICS OF INTEGRATING ISSUES OF SOCIAL JUSTICE INTO YOUR MATH CLASS

1. Start with a strong mathematical framework

If the math is no good, than the lesson or unit is no good. Find a textbook or curriculum that has really good mathematical ideas and scaffolding. Check your state standards. I'm not saying the Standards are always clear and thoughtful, but it's important to know what you're expected to cover in class.

Then, figure out how the math can be used to understand/address a social justice issue. In other words, always fit the issues to the math.

2. Talk to your students to decide on the issue to focus on

Your goal is to change the context of the curriculum into something that deals with a social justice issue. Consult your students. See what issues they are thinking about, what current events they care about, what problems they see in their communities that they would like to be solved. Chances are that they will be a lot more interesting in studying something that they've identified as important, rather than an issue that you've chosen for them.

You can also use the Math Skills and Social Justice Chart at the end of this Guide to help you determine which issues would be appropriate to explore based on the math you're covering.

3. Create Essential Questions

Set the unit in the context of a few broad, open-ended questions that do not have one specific answer (often called Essential Questions). For example: "Which neighborhoods in our city have the highest teenage incarceration rates, and what are the similarities and differences in the economic status and demographics of these communities?" or "Does race play a factor in who is getting mortgage loans in our city?" These questions should have both a mathematical and social justice component to them.

4. Start by introducing the Social Justice issue

Most young people think about these issues in terms of fair/unfair, so help them to see what is unfair about the issue you're going to study, and discuss or help them discover for themselves how they are affected by these issues. This will get them engaged in the class and the lesson/unit. You can introduce an issue by bringing in guest speakers, showing video clips from movies or documentaries, going on field trips, etc.

5. Begin introducing the math

Using the original text/curriculum you chose, begin introducing the mathematical ideas and skills for the unit. You want students to understand how the math can be useful to solve the larger unit problem and/or to understanding the social issue more deeply. Hopefully this well help you avoid having them ask: "Why are we learning this?"

6. The social justice issue doesn't have to be the focus of every lesson

Don't feel that every lesson needs to be connected to the social justice topic. Spend time doing worksheets or other activities that help deepen students' understanding of the math involved. But, come back to the Essential Questions and the social justice issue periodically so that students have the experience of applying the math they've learned to this real situation. You can also work with other teachers in your school to address this social justice issue in their classes as well. This way, students can still be thinking about the issue on a regular basis without always having to discuss it in your classroom.

7. Scaffold both the math concepts and the social justice issue

Work your way up to a more complex understanding of both the math and the social justice issue. Don't go over your students' heads on day one with either.

8. End with a great project

End the unit with a project that ties together the math concepts and the social/economic justice issues, and allows you to assess your students' understanding of both. You can also give them quizzes and tests along the way, but make sure that you're asking students to apply the math they've learned to answering or showing an understanding of a real issue or problem.

And whenever possible, provide students with an opportunity to share and present their work.

EXAMPLES

ORGANIZING FOR THE FUTURE

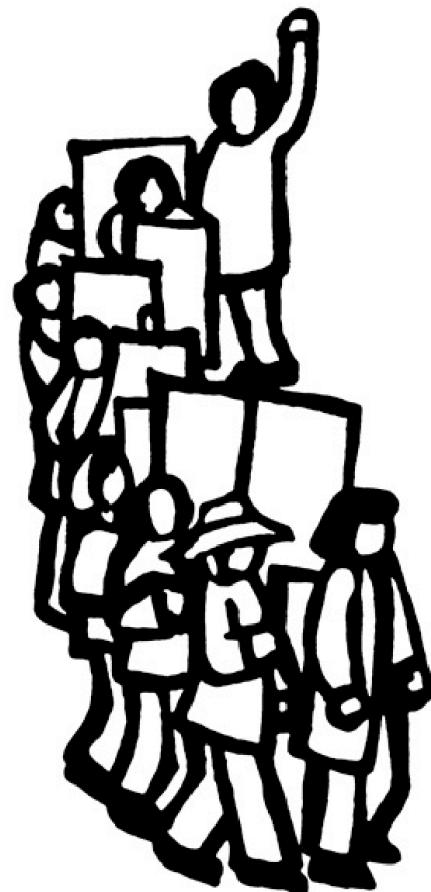
This problem was part of an Algebra unit on Linear Programming I wrote called “Funding an Education.” This particular problem is an adaptation of one submitted to RadicalMath.org.

The local Union SEIU is planning a rally in front of the federal building in order fight for better wages for home health care workers. The union believes that it is unfair for these workers to only make minimum wage, and are upset that many of the union members working long hours are denied overtime pay. There is a enormous coalition (made up of community groups, unions, activists, and various political parties) that has planned for the rally to happen in two weeks and the union is responsible for bringing people from their organization to attend and show support for this important cause.

There are two ways to organize for this event: making hour-long blocks of telephone calls and sending out sets of mailings. Including labor, bills, and materials, the costs of a one-hour block of calls is \$60 and the cost for one mailing set is \$40. Each block of phone calls requires 1 hour, while each set of mailings requires 2 hours to complete. According to the budget, the union can only spend \$600 organizing for this demonstration, and they agreed to spend at least 6 hours making phone calls. Also since a large part of their base speak English as their second language and since other organizers cannot use the telephone, they determined that there should be at least twice as many sets of mailings as blocks of phone calls.

Based on past results, block hour of calls gets 30 people to come, and every set of mailings gets about 16 people to turn out.

Determine what combination of phone calls and mailings will maximize the number of people who turn out for the rally.

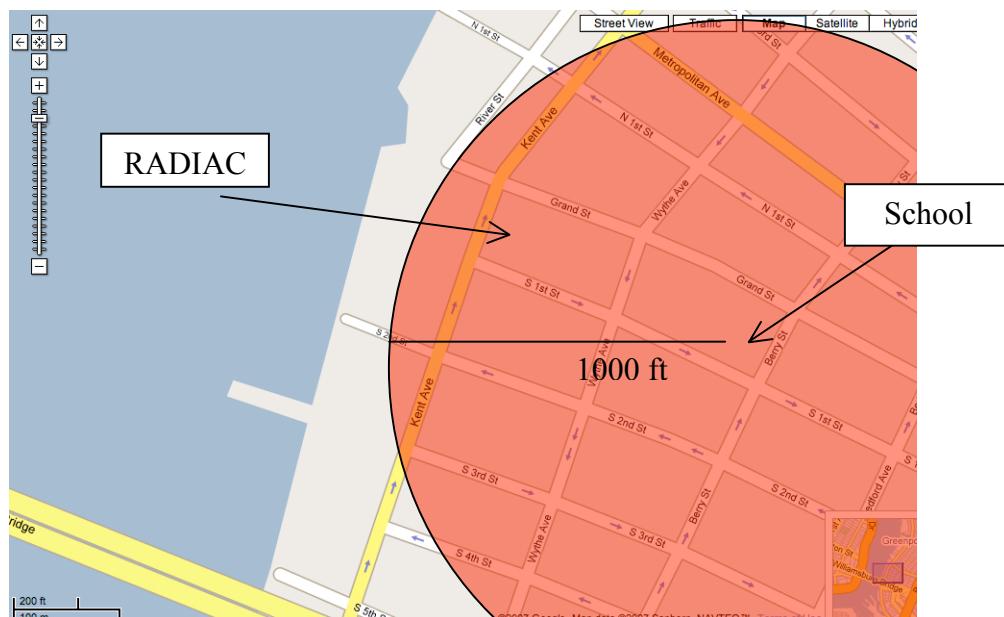


THE TOXIC CIRCLE

A true story. There is a toxic waste storage facility called RADIAC near where I used to teach. The head of our community organization, El Puente, was in the process of trying to get a law passed that would force the closure of any toxic waste facility that was within 1,000 feet of a school, and he asked me to measure the distance from RADIAC to the closest school.

I brought this problem to my 10th grade class that had recently completed a geometry unit. I gave my students a ruler, a calculator, a compass, a blank version of the map below, and the following problem:

"If El Puente can prove that RADIAC is within 1,000 feet of Middle School 380, we might be able to get it closed down. Use three different methods to determine whether or not RADIAC is within 1000 feet of the school."



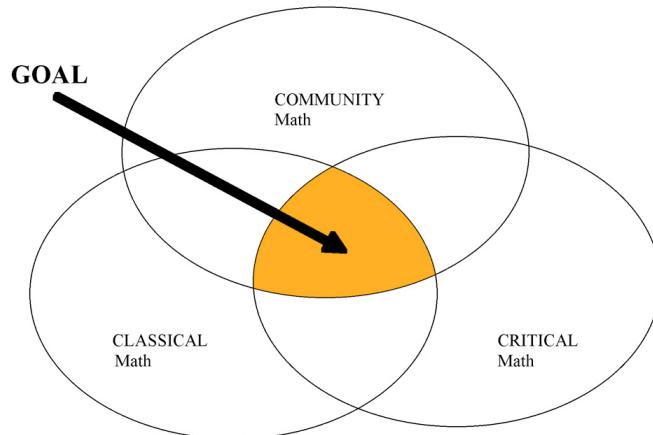
The methods they used to find the distance between the school and RADIAC included:

1. Making a right-triangle on the map with streets as legs, walking and counting their shoe-steps along sides "a" and "b", measuring their shoes in inches and converting them into feet, and using the Pythagorean Theorem to calculate side "c" – the distance between the school and RADIAC.
2. Measuring the distance on the map between the two buildings in inches, and using the scale to convert from inches to feet.
3. A combination of 1 and 2 from above.
4. Measuring 1,000 feet (in inches) somewhere on their paper, and drawing a circle with a 1,000 foot radius around the school (as shown above in red).

A supplemental problem could have included asking students to find the approximate number of people who lived within 1,000 feet of RADIAC, which they would have done by using census data to determine the population and dividing that by the area of a circle with a 1,000 ft radius.

A MODEL FOR DEVELOPING SOCIAL JUSTICE-BASED MATH CURRICULUM

This is a model that one of my mentors, Rico Gutstein, has written about¹⁵. I've only begun to think about my work within this framework.



Paraphrasing from Gutstein's article:

- **Community knowledge** refers to what people already know and bring to school with them. This includes the knowledge that resides in individuals and in communities that usually has been learned out of school, and involves how people understand their lives, their communities, power relationships, and their society.
- **Critical knowledge** refers to the sociopolitical conditions of one's immediate and broader existence. It includes knowledge about why things are the ways that they are and about the historical, economical, political, and cultural roots of various social phenomena.
- **Classical knowledge** generally refers to formal, in-school, abstract knowledge... Classical mathematical knowledge clearly has high-status in society as well as a strong Eurocentric bias, and while [we] critique it, [we] recognize its power and cultural capital and argue that students need to develop it for several reasons. They need it for personal, family, and community survival, especially for students who come from economically marginalized spaces. But even more than that, [we] believe it is crucial that students appropriate, in this case, the “master’s tools” with which to dismantle his house

Based on this model, the goal of a great math project is one that falls in the nexus of these three fields. These projects are rooted in solid mathematical ideas (Classical), explore important social justice issues (Critical), and honor the history and experiences of the students (Community) that you are working with.

¹⁵ Gutstein, Rico, “Connecting Community, Critical, and Classical Knowledge in Teaching Mathematics for Social Justice” in the Montana Mathematics Enthusiast, ISSN 1551-3440, Monograph 1, pp 109-118.

A RESPONSE TO THE CRITICS

The following questions were emailed to me recently, and are representative of those frequently posed by critics of integrating social justice into math curricula.

What would you say to parents who want their children to learn math in a traditional classroom but are placed in classes teaching social justice math?

Traditional math classes have traditionally not effectively engaged young people in learning math, and are partially responsible for creating our math-phobic society. In addition, I believe that it is possible to cover all of the important math concepts from a “traditional” class through a social justice context.

If it turned out that students who take social justice math were less prepared for careers in mathematics, engineering, accounting and the sciences, than those taking traditional math curricula, would this deter you from promoting this type of instruction?

I think that if “Social Justice Math” is being taught effectively, it will prepare students for these math-based careers, as well as for effectively using math in other “non-math” careers. Under the umbrella of SJM, I’m including the need to prepare young people, especially low-income youth of color, for these careers.

What if the test scores of students taking social justice math were way behind the scores of other students? Would this affect your support?

This question assumes that you value standardized tests as useful tools in analyzing what people understand and are able to do. I do not. If my students are unable to engage in critical research using mathematics, unable to use and write about trying a range of problem-solving techniques to solve math problems, or unable create detailed reports on self-identified topics that demonstrate an deep understanding of math... THEN I would be worried. But that isn’t happening.

What if it turns out that private schools that teach middle class and upper class children do a better job of preparing students than public schools that teach poor, urban children? If poor, urban children are already behind because of their socio-economic status, does it do them any favors in life to deprive them of the same teaching that allows the middle and upper class kids to succeed?

Urban is a code word for kids of color, right? Lets be honest here.

Upper and middle class students in elite private schools are going to have incredible advantages over low-income and youth of color regardless of the math curricula that is being used. I don’t look at SJM as depravative teaching. Rather, I see it as an important tool in helping my students fight for the rights to the same quality education that these other students receive. This includes greater funding for public schools, smaller class sizes, Living Wage jobs for their parents so that the students don’t also have to hold down 30+ hour/week jobs, etc.

What would happen to the progress of mathematics as an intellectual discipline if all children were taught social justice math rather than traditional math?

Mathematics has been used to help people, but more often it has been used to hurt them. Math was behind the development of nuclear weapons. It is used to maintain an economic divide between a handful of wealthy, White people and the billions of poor people of color around the world. It is used as a rationale for depriving people of access to cheap, life-saving drugs. So my question is: what good has the progress of mathematics as an intellectual discipline done for people? Maybe if our mathematicians had a background in social justice, we wouldn't have so many people suffering around the world.

What type of career, job, or position in life can one hope to gain by mastering the skills and knowledge in a social justice math program?

Activist. Organizer. Teacher. Principal. Doctor. Lawyer. Engineer. Architect. Business Owner. Accountant. City Planner. CEO. Parent. Police Officer. Politician. Shall I continue?

Aren't you indoctrinating your students with your own political beliefs? Politics doesn't belong in the classroom anyway.

Our classrooms are politicized spaces before we walk in the door because political parties in our country are dictating what should and should not be happening in our classrooms. *What* we're supposed to teach, and *how* we're supposed to teach it, has been predetermined by someone with a political agenda. My goal is to provide my students with varied sources of information and support them in coming to their own conclusions.

MATH SKILLS & SOCIAL JUSTICE TOPICS CHART

This chart is a work in progress. See www.radicalmath.org/categories.php for more examples.
Please send any comments, suggestions or feedback to: jonathan.osler@gmail.com

Math Topic	Social Justice Issues	Some Useful Websites
Adding	<ul style="list-style-type: none">• Basic Family Budgets<ul style="list-style-type: none">◦ Determining how much money a family needs to survive, live comfortably, etc.• Mayan Mathematics<ul style="list-style-type: none">◦ Learn how to add, subtract, multiply in a base 20 system	<p>http://www.epinet.org/content.cfm/datazone_fambud_budget</p> <p>http://www.dpsk12.org/programs/almaproject/pdf/MayanMathematics.pdf</p>
Averages	<ul style="list-style-type: none">• Union Salaries<ul style="list-style-type: none">◦ Calculating the “average salary” of a worker from a set of employee salaries to see how mean/median/mode could result in different averages• US Casualties in Iraq<ul style="list-style-type: none">◦ Take casualty data for the past 12 months and calculate a monthly average from the perspective a military recruiter and from an anti-war activist	<p>http://www.bls.gov/ces/home.htm#data</p> <p>http://www.unionstats.com/</p> <p>www.iraqcasualties.org</p>
Combinations	<ul style="list-style-type: none">• The Lottery<ul style="list-style-type: none">◦ Study how the Lottery works, why it's nearly impossible to win, and the economic damage it causes	<p>http://mathforum.org/library/drmath/view/56122.html</p>
Exponents	<ul style="list-style-type: none">• Compound Interest• Population Growth<ul style="list-style-type: none">◦ Growth/decline of food and water resources, cities	<p>World Population Growth:</p> <p>http://www.census.gov/ipc/www/worldpop.html</p>
Fractions	<ul style="list-style-type: none">• War Budgets<ul style="list-style-type: none">◦ Comparing budgets for defense department to budgets for other social services to the total budget	<p>http://www.warresisters.org/piechart.htm</p>

Fractions (cont)	<ul style="list-style-type: none"> ○ Comparing how money spent on military operations could be used to support other important causes (ex: if a bomb costs \$10 million and it costs \$10,000 to provide health care for an entire family for a year, how many families could get health care for the cost of this bomb). 	http://costofwar.com/index.html
Geometry - Circles - Triangles - Area - Symmetry	<ul style="list-style-type: none"> • Liquor Stores/Fast Food Density <ul style="list-style-type: none"> ○ Look at how many liquor stores/fast food chains are within a 1-mile radius or within 5 blocks of your school. This can be compared with schools in other neighborhoods • Environmental Racism <ul style="list-style-type: none"> ○ Determine the density of toxic waste facilities, factories, dumps, etc, in the neighborhood • Gentrification <ul style="list-style-type: none"> ○ Change in the density of people in a neighborhood (by race/income) • Ethnomathematics <ul style="list-style-type: none"> ○ African Fractals ○ Islamic Tessellations ○ Origami 	www.brainzip.com maps.google.com www.fastfoodmaps.com www.epa.gov/enviro/wme www.census.gov http://www.rpi.edu/~eglash/eglash.dir/afractal/afractal.htm http://mathforum.org/sum95/suzanne/tess.intro.html www.paperfolding.com
Graphing	<ul style="list-style-type: none"> • Line Graphs <ul style="list-style-type: none"> ○ Incarceration rates for different populations, races • Pie Graphs <ul style="list-style-type: none"> ○ Budgets – Determining what percent of your taxes went to each branch of the government • Scatterplot Graphs <ul style="list-style-type: none"> ○ Correlation between % any two of the following factors: percent of population that is people of color, rates of poverty, crime, health issues (rates of asthma, AIDS, diabetes, obesity, etc), pollution, etc. 	Total: http://www.ojp.usdoj.gov/bjs/glance/tables/corr2tab.htm By Race: http://www.ojp.usdoj.gov/bjs/pub/pdf/cpus9701.pdf http://www.nationalpriorities.org/auxiliary/interactivetaxchart/taxchart.html www.census.gov www.infoshare.org

Inequalities	<ul style="list-style-type: none"> Graduation Rates <ul style="list-style-type: none"> Creating algebraic inequalities to describe limits on funding, class size, school size, etc., how can a school or district maximize graduation rates? 	See “The School Funding Project” http://www.radicalmath.org/main.php?id=schoalfunding
Logarithms	<ul style="list-style-type: none"> Growth Rates <ul style="list-style-type: none"> People, prisoners, AIDS cases, health factors, etc. 	Global Health: http://globalatlas.who.int/ Also: See other resources listed
Percents	<ul style="list-style-type: none"> Interest & Compound Interest <ul style="list-style-type: none"> Making money through a Savings Account Increasing debt on a Credit Card Payday and Tax Refund Loans Predatory Lending Mortgage Payments APR – how it works, comparing different APR's Growth Rate <ul style="list-style-type: none"> Growth in rates of homeless, poverty, people in jail, etc. Proportions, ex: <ul style="list-style-type: none"> Percent of each race in total population vs. incarcerated (or in the military, killed in the war, dropping out of high school, college graduates, etc) 	http://www.demos.org/page37.cfm http://www.nedap.org/resources/documents/FINALRALREPORT.pdf http://nedap.org/programs/fairlending.html Poverty: http://www.census.gov/hhes/www/poverty/histpov/histpovtb.html Health: http://www.cdc.gov/nchs/data/hus/hus05.pdf Housing: http://www.census.gov/hhes/www/housing.html
Probability	<ul style="list-style-type: none"> Racial Profiling <ul style="list-style-type: none"> Explore the probability that a traffic stop should be (and is) of a person of color 	http://www.racialprofilinganalysis.neu.edu/ www.census.gov
Rates	<ul style="list-style-type: none"> Prison growth <ul style="list-style-type: none"> Rates of different races and genders becoming incarcerated Compared to growth of high school graduates Compared to growth of funding for higher education 	http://www.ojp.usdoj.gov/bjs/abstract/p04.htm http://nces.ed.gov/pubs2002/dropout91_97/all_tables.asp http://coe.ilstu.edu/grapevine/Welcome.htm

Rates (cont.)	<ul style="list-style-type: none"> • Population growth <ul style="list-style-type: none"> ◦ In different countries (also good for looking at a population density) ◦ Compared to resources (food, oil, water, etc) available • Resource Density <ul style="list-style-type: none"> ◦ Density of banks compared to check-cashers and pawn shops in rich vs. poor communities 	<p>http://www.nedap.org/programs/mapgallery.html</p>
Regression	<ul style="list-style-type: none"> • See “Scatterplot Graphing” above 	
Slope	<ul style="list-style-type: none"> • Rates of Increase/Decrease of: <ul style="list-style-type: none"> ◦ People in prison ◦ Poverty ◦ Population ◦ AIDS cases 	<p>See resources listed above</p>
Statistics	<ul style="list-style-type: none"> • Community Surveys <ul style="list-style-type: none"> ◦ Teach students how to write surveys, and then survey your school or local community about any social issue. Statistical analysis can be used to understand the results: averages, ranges, frequency tables, graphing, correlation, percents, hypothesis testing, variance, standard deviation, etc. • Racial Profiling <ul style="list-style-type: none"> ◦ Try different sampling experiments to understand the why having a disproportionate number of drivers of color stopped by police is unfair 	<p>www.datacenter.org</p> <p>See above links for Statistical data to analyze</p> <p>http://www.racialprofilinganalysis.neu.edu/</p>
Systems	<ul style="list-style-type: none"> • Resource Availability <ul style="list-style-type: none"> ◦ Determining at what point the resources available and societies needs will be the same (such as need for housing and new housing available) 	