

Teaching for Social Justice in Mathematics

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Linda Fulmore, Position Paper Editor

Kristopher J. Childs, Associate Newsletter Editor

Pat Baltzley, Leadership Academy & Fall Seminar Co-Director

Outcomes

- How do you define teaching mathematics for social justice?
- How would you integrate a social justice component into a mathematics lesson?
- What steps must one take in order to create an environment conducive to the sustainment of teaching mathematics for social justice?

Teaching for Social Justice in Mathematics

Developing Rich Lessons

“The NCSM/TODOS position statement is an urgent call for transformative thinking for district offices, school boards, universities, legislature, and especially in the **classroom**.”

<http://www.mathedleadership.org/resources/position.html#1>

Teaching for Social Justice in Mathematics

Developing Rich Lessons

Engaging in **sociopolitical turns**

- When students are disengaged, questions instructional practices and interrelations with students
- Situates mathematics as an analytical tool to make sense of social issues deemed unfair.
- Authentically seeks student mathematics knowledge and voice.

<http://www.mathedleadership.org/resources/position.html#1>

Teaching for Social Justice in Mathematics

Developing Rich Lessons

Leaders, Teachers, Students

- What is the meaning of **justice**? What is the meaning of **fairness**? How are they similar? How are they different?
- Can two people disagree on what is fair?
- If something is unjust, can something be done about?

Teaching for Social Justice in Mathematics

Developing Rich Lessons

- **Justice** – a process that judges and brings about fairness
- **Fairness** – free from bias and inequities
- **Social Justice** – the concept of society receiving fairness



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Teaching for Social Justice in Mathematics

Developing Rich Lessons

- Minimum wage
- Affordable housing
- Childhood poverty
- Lead poisoning in water
- Racial profiling
- Incarceration rates
- Unemployment

Determine Social Justice Goals.

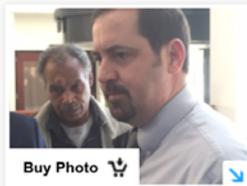
- Awareness
- Mathematics as a powerful tool
- Unfair treatment of people
- Correlations
 - Education and prison population
 - Health care and race
 - Wages and poverty
 - Wages and housing
- Discrimination

Flint Water Crisis



Water plant official: Move to Flint River 'bad decision'

Paul Egan, Detroit Free Press Lansing Bureau 9:15 p.m. EDT March 29, 2016



Buy Photo

(Photo: Paul Egan/Detroit Free Press)

FLINT — A Flint water treatment plant official testified at a legislative hearing Tuesday he wanted to double his staff and run the plant on a test basis for six months when the city began taking its drinking water from the Flint River in 2014, but his requests were denied by the city, which was under the control of a state-appointed emergency manager.

Mike Glasgow's name is well-known to close followers of the Flint public health crisis because of the earlier release of an e-mail he sent to Michigan Department of Environmental Quality officials on April 17, 2014, saying the Flint water treatment plant was not ready to start treating Flint River water and would do so only "against my direction."

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Flint Water Crisis

What do you know about the Flint Water Crisis?

Turn and Talk

Flint Water Crisis Synopsis

- City of Flint begins taking water from the Flint River in 2014
- Mike Glasgow sends an email in April 2014, saying the Flint water treatment plant was not ready to start treating Flint River water and would do so only "against my direction"

Flint Water Crisis Synopsis

- There is a public health crisis, which includes lead contamination of Flint's drinking water and possible ties to outbreaks of Legionnaires' disease
- There are concerns about health problems, costly damage they believe the lead-laced water has done to their dishwashers, water heaters and other appliances

Flint Water Crisis Possible Tasks

What are some possible mathematics related tasks one could create using the Flint Water Crisis as a springboard?

Turn and Talk

Flint Water Crisis (Elementary Task)

Your school has adopted 10 households to supply water bottles to for three months. Listed below are the 10 households and the number of residents in each household. Determine how many water bottles will be needed to supply the 10 households and the cost.

Household 1 has 4 residents	Household 6 has 3 residents
Household 2 has 3 residents	Household 7 has 8 residents
Household 3 has 4 residents	Household 8 has 2 residents
Household 4 has 1 resident	Household 9 has 6 residents
Household 5 has 1 resident	Household 10 has 2 residents

Flint Water Crisis (Elementary Task)

What are some possible questions students may have?

How do you think students will attempt to solve the task?

After solving what is the next step?

Turn and Talk

Task Activity

Task 1

 Obama pledge to welcome 10,000 Syrian refugees far behind schedule



By **Laura Koran**

🕒 Updated 5:53 AM ET, Fri April 1, 2016



Task 2

You Don't Need a Science Degree to End World Hunger

Scientists aren't the only ones who can solve problems like malnutrition—in fact, people who face hunger might be better at solving it.



Key Questions

What task will students be assigned based upon the given social issue?

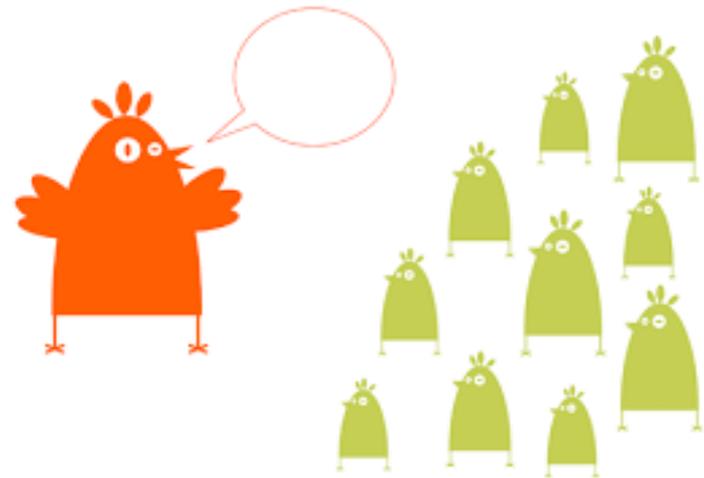
What are some possible questions students may have?

How do you think students will attempt to solve the task?

After solving what is the next step?

Debriefing

- Think of one thing that intrigued you from the tasks. Think about WHY it intrigued you.
- Stand and Share



Some food for thought...

- How do you develop these lessons?
- What are some challenges?
- What are some things learned?
- What are key components?
- How can you develop possible solutions?
- How can we use mathematics to gain insights into an issue and use mathematics to develop a solution for the issue?
- How can NCSM support you?

Getting Started...

- Start small with 1-2 day projects.
- Begin with a pilot classroom or school.
- Be inclusive; keep principals and others informed.
- Inform parents in opening of school information.
- Allow students to pick topics.
- Keep mathematics rigorous.
- Allow time for discussions.
- Get feedback from students.
- Organize outside of class projects.
- Develop as an activity for Math Club.

Specifically...

- Identify a concept/skill that you are teaching as part of your regular curriculum and relate it to a lesson [idea](#) (minimum wage, childhood poverty, Flint water crisis, etc.)
- Get to know your students and their communities well and listen to the issues they bring up...these are sparks of ideas that connect the curriculum to students' lives.
- Look to the media for potential sources of projects (e.g., Flint water crisis)

Specifically...

- Use cartoons to generate lesson ideas.



Ask the students what the message is of the cartoon. Have the students find the federal and state minimum wages. Ask how much money a person working 40 hours per week would need to have for the basic necessities of food, rent, clothes, health care, transportation, etc.

Ask what measures could working people take in order to receive adequate wages. What role could math play in their efforts?

Adapted from *Rethinking Mathematics: Teaching Social Justice by the Numbers*, edited by Eric Gutstein and Bob Peterson

Specifically...

- Start With The Math.
 - Find an issue that fits the math, not the other way around. When you try to make the math fit an issue you want to cover, most likely, you will end up sacrificing some of the mathematical content.

Pitfalls/Challenges

- Time
- Standardized Testing
- Mandated Curriculums
- Good Math isn't the same as Good Politics!
- Good Politics isn't the same as Good Math!

Key Components

- Start with a strong mathematical framework
- Talk to your students to decide on the focus issue
- Create essential questions
- Start by introducing the social justice issue
- Begin introducing the math
- Social justice issue doesn't have to be the focus of every lesson
- Scaffold both the math concepts and the social justice issue
- End with a great project

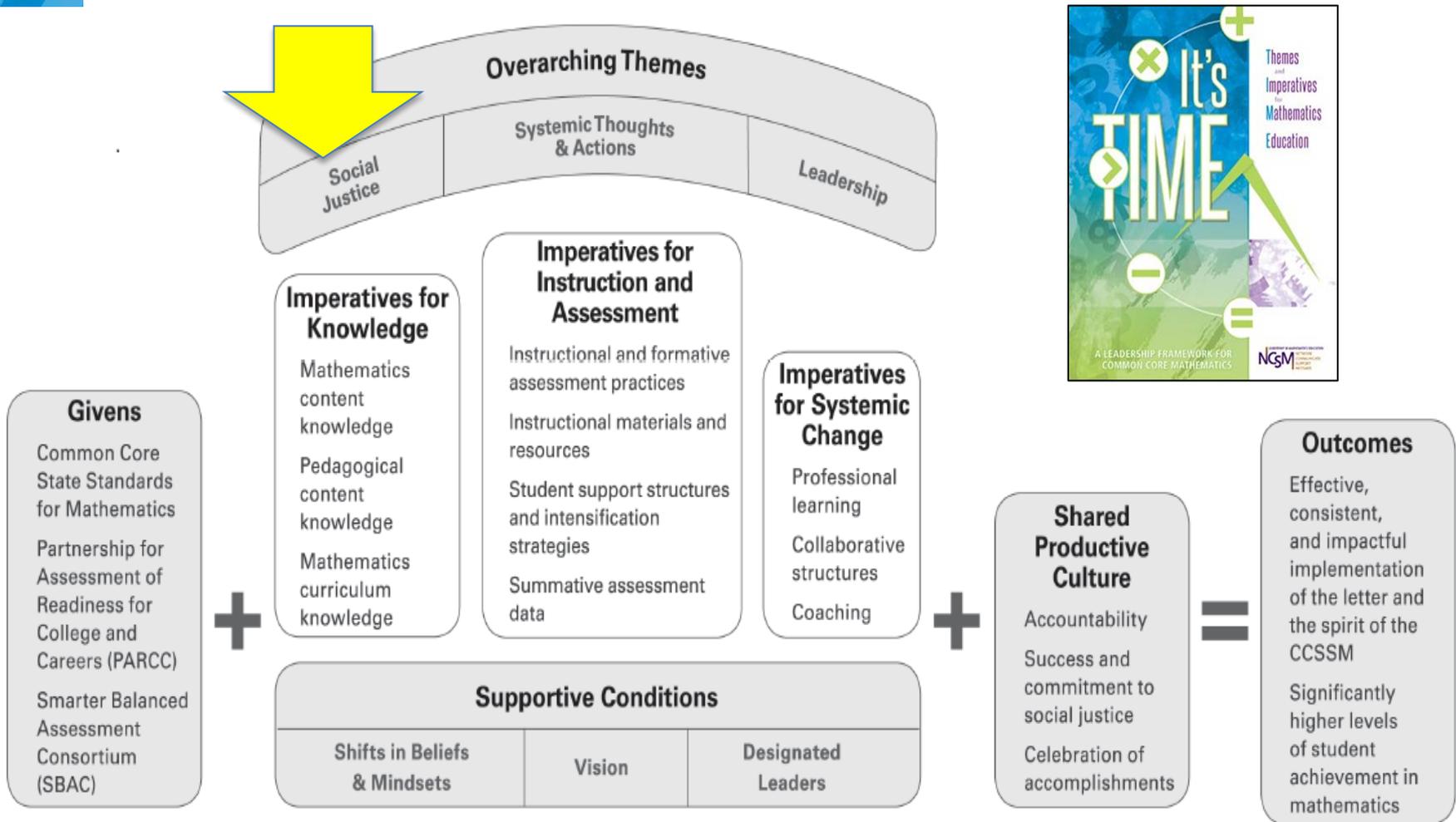
Great quotes...

- “Real life poses problems with solutions that require dialogue and collective action.”
- “Math has the power to help us understand and potentially change the world.”
- “With math, it’s like you have more defense.”

from *Rethinking Mathematics: Teaching Social Justice by the Numbers*,
edited by Eric Gutstein and Bob Peterson

What can NCSM do to support you?

It's TIME, p.3



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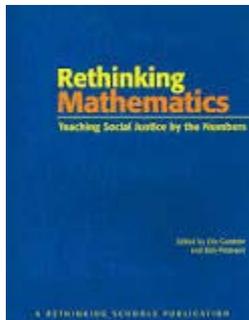
Developing Rich Lessons

Leaders & Teachers

- Read and study the position statement.
- Pick a reference for further study.
- Formulate discussion questions.
- Seek diverse thinking and understanding.

Resources

- NCSM Position Papers:
<http://www.mathedleadership.org/resources/position.html>
- Radical Math:
<http://www.radicalmath.org/>
- *Rethinking Mathematics: Teaching Social Justice by the Numbers*, edited by Eric Gutstein and Bob Peterson



Questions?

Contact Information

- Linda Fulmore
 - lmfulmore@yahoo.com
- Kristopher J. Childs
 - kristopher.childs@mathedleadership.org
- Pat Baltzley
 - pbaltzley@mathedleadership.org

