

Calculated Change

Social Justice in the Math Classroom

NCTM Annual Meeting 2017

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#calculatedchange



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Curriculum Developer
THINK Global School

- Develops interdisciplinary modules for a traveling boarding school
- 10 years experience teaching middle school and high school math internationally
- Analyzing problems is the heart of math.

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Secondary Math Teacher
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- 20 years teaching educating in Elementary, Middle, High School, and University
- Teaches a Math in Art, Technology and History Class
- I want to make math relevant

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Calculated Change Workshop Outline

How to start

Openers

Graphs
Articles
Lessons

Infographics

Brainstorm

In groups come up with
possible openers or
lessons

Projects

Slow Data Collection

Student involvement in
perspectives

Resources

Let's Share

Give data to build a
project around
How to follow up after
NCTM

Collaborate

Just start

Brainstorm ideas with
other participants

Quick Group introductions

Name

School/location

In regards to Social Justice share:

What are you hopeful about?

What keeps you up at night?

Rationale

"Politics, logic, and math are inseparable."

Grace A. Chen

"To not incorporate math into issues is a political choice. It tells students math is not relevant, math has no role in helping to understand the world, and students get no experience in using math to make sense of situations."

Rethinking Mathematics by Gutstein & Peterson

"Justice is what love looks like in public."

Nikita Oliver

Common Core Standards

Standards of Mathematical Practice addressed

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision

"Math is a discipline and a tool to understand other disciplines."

Rethinking Mathematics by Gutstein and Peterson

Empower students

To be informed and get involved.

Increase Numeracy

Challenge students to question media and statistics.

Discuss Current Issues

Putting math in a relevant context to issues that impact students and their communities.

Foster Empathy

Through learning about disparities in context and reminding students that people are not numbers.

Lesson Opener

Zoom In- Project Zero Thinking Routine

Looking closely at the small bit of the graph that is revealed.

- What do you see or notice?
- What is your hypothesis or interpretation of what this might be based on what you are seeing?

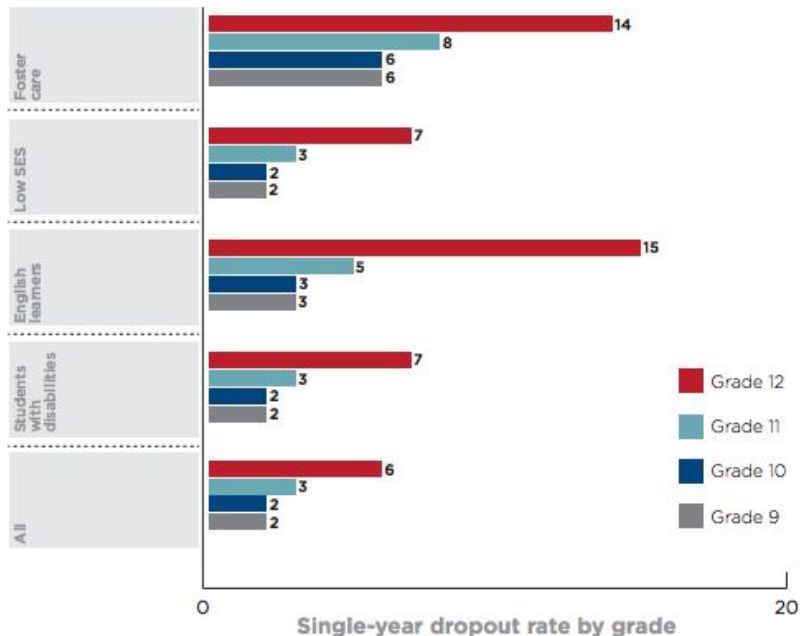
Reveal more of the Image

- How does this change your hypothesis?
- Has the new information answered any of your wonders or changed your previous ideas?

What are the new things you are wondering about?

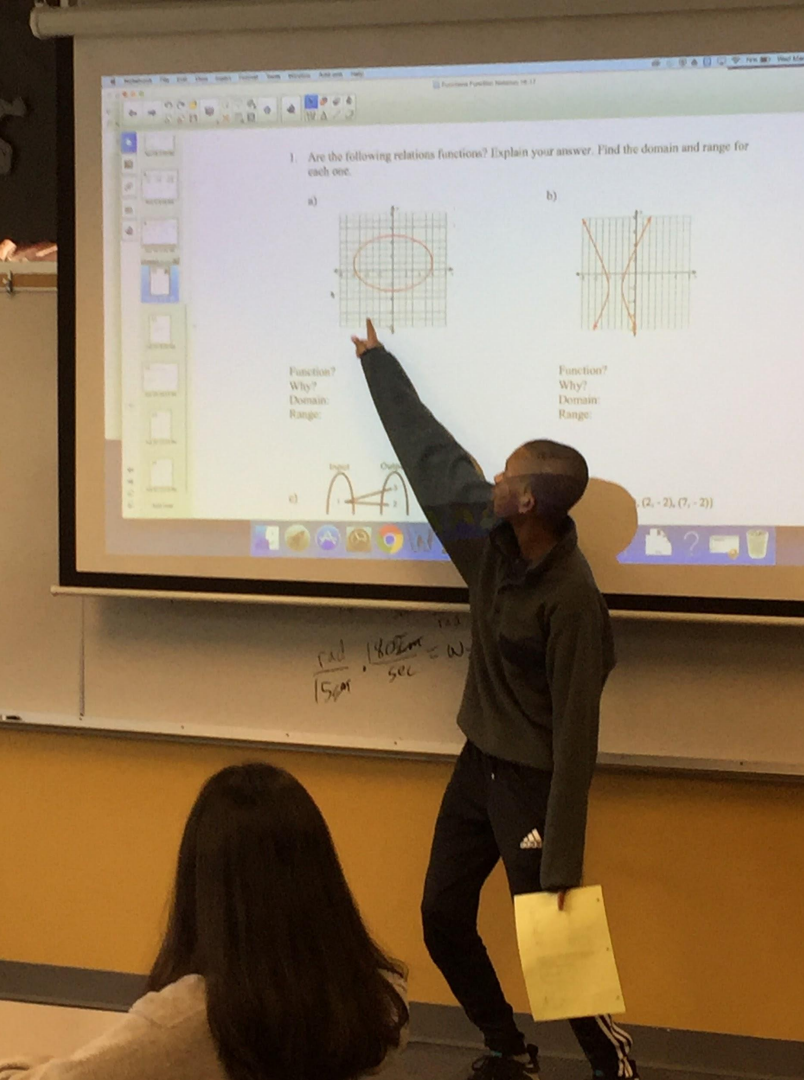
What lingering questions remain for you about this graph?

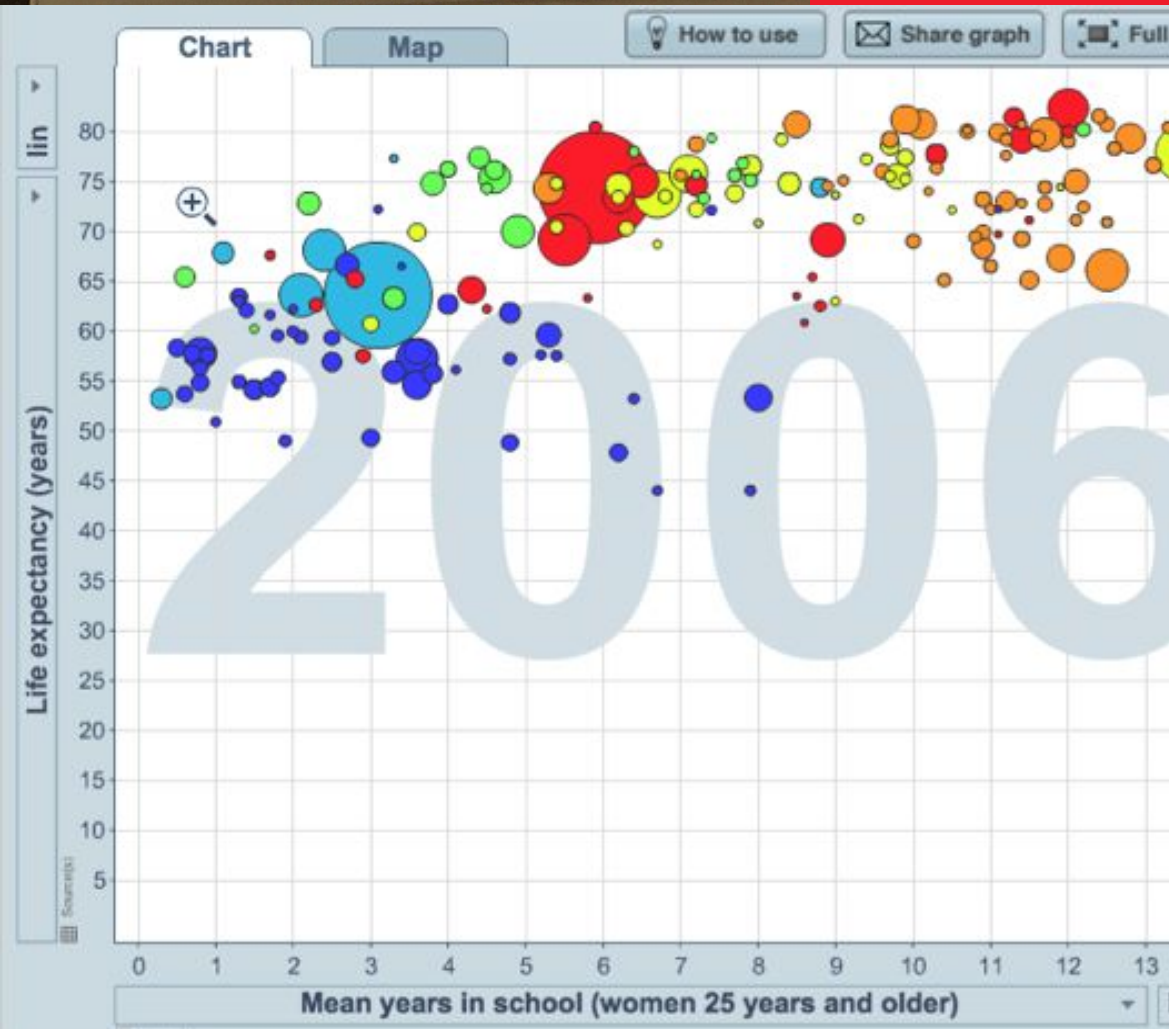
Figure 20. Single-year dropout rate by grade for students in foster care, other at-risk student subgroups, and all students in California public schools, grades 9–12, 2009/10



Ways to Start

Summarizer of the day





Ways to Start

Summarizer of the day

Gapminder Functions



June Tue Feb 21, 2017 at 11:54 am

In math, the term Identity means "An equation that is true no matter what values are chosen". That means if you had the equation $a/2 = a \times 0.5$, no matter what value a is, it will always make the equation true. Just like how $a/2 = a \times 0.5$ will always be true, all the things that apply to me will always be a part of my identity. For example, being female or a Pacific Islander will always be a part of who I am. Being a daughter, a sister, a neice, a cousin, etc. will always equate to my identity. After all, a person's identity are the things that make up them as a person and all of the things stated before are what makes me, me. One could even say that if I were to put the things that make me, me, into an equation with an Identity, it would look like this:

Pacific Islander = June

Female = June

Daughter = June

Sister = June

There are more things that I could list, but these are the main points of my identity and what makes me June.

What is the probability of winning
1st prize?

What is the expected value for
one play of the lottery?

Is the lottery a "tax on the poor?"

Probability in the Lottery -Lesson

Math Keyword online Discussion

RETHINKING MATHEMATICS

TEACHING SOCIAL JUSTICE BY THE NUMBERS



Edited by Eric (Rico) Gutstein & Bob Peterson

A RETHINKING SCHOOLS PUBLICATION
SECOND EDITION

Living Algebra, Living Wage

Sweatshop Accounting

Understanding Large Numbers

When Equal Isn't Fair

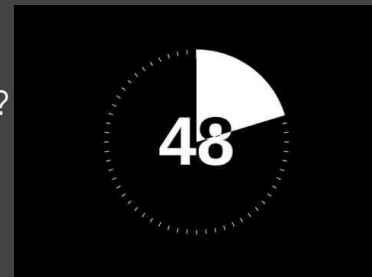
Racism and Stop and Frisk

The Geometry of Inequality

Write the Truth: Presidents and Slaves

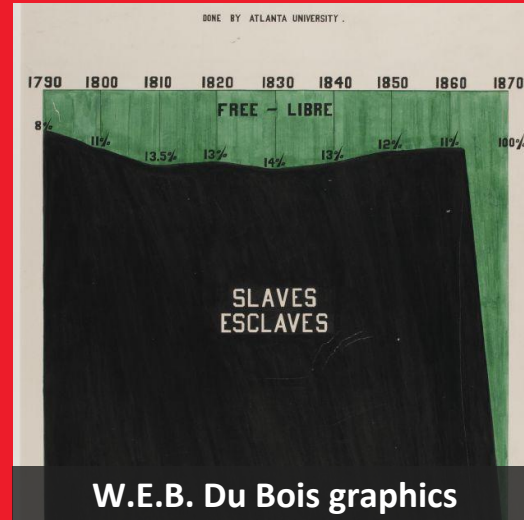
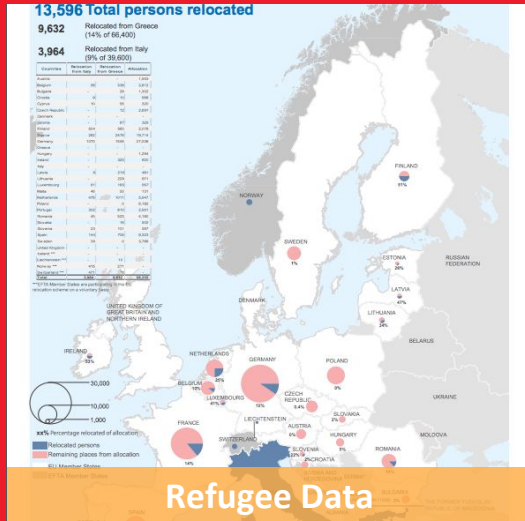
Your Turn

- Take 1 minute to brainstorm on your own:
- What you could do in the math class with this infographic?
 - What content could be related to?
 - What are you curious about

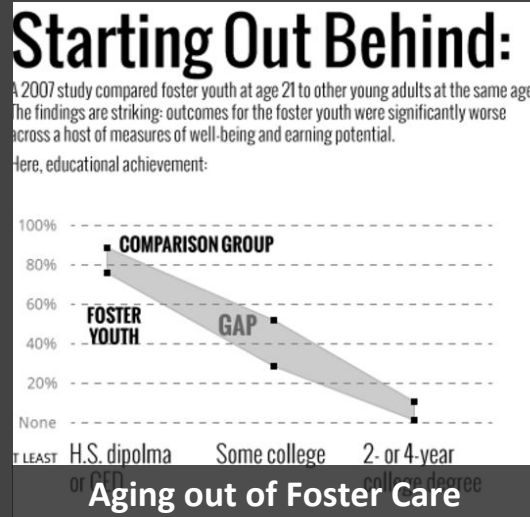
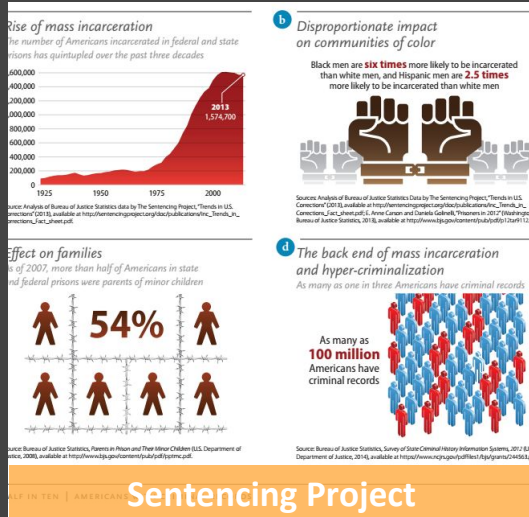


- Group time 10 minutes to determine how to use this in the math classroom.
- As a group identify learning targets the visuals can be connected to.

Group Infographics



Group Infographics



Slow Data Collection

Adaptation of Shari Tishman's "Slow Looking"
Harvard Project Zero

Inquiry Based

Identify a local issue with students that can be applied on a national or global level

Student Ownership

Students decide the perspective and audience and make recommendations.



Tools Required

Rolled into daily routine
Tech: Google forms on mobile devices
Low Tech: Newspapers

Question the numbers

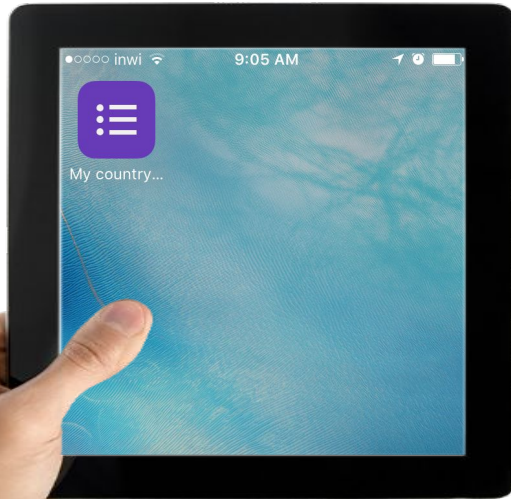
Students are more sceptical and involved if they have personally collected the data

Water Bottle Project

Grade 9 math at Washington International School



Slow Data Collection



Google Forms

- Set up the form
- Send the link to students
- Have them save to their home screen on a mobile device

Resources

Phase 2 of planning

Find more resources & data

<http://tinyurl.com/lerme85>

Decide what type of activity

Where is the math?
Ex. Calculations, modeling

Share

Take photos of your work

Tweet your ideas

#calculatedchange

Or add ideas to padlet

<https://tinyurl.com/m8vya7w>

@akariske

@davidmpeabody

Thank you

Just start

Just share

Our presentation:

<http://tinyurl.com/kynhqz6>

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@davidmpeabody