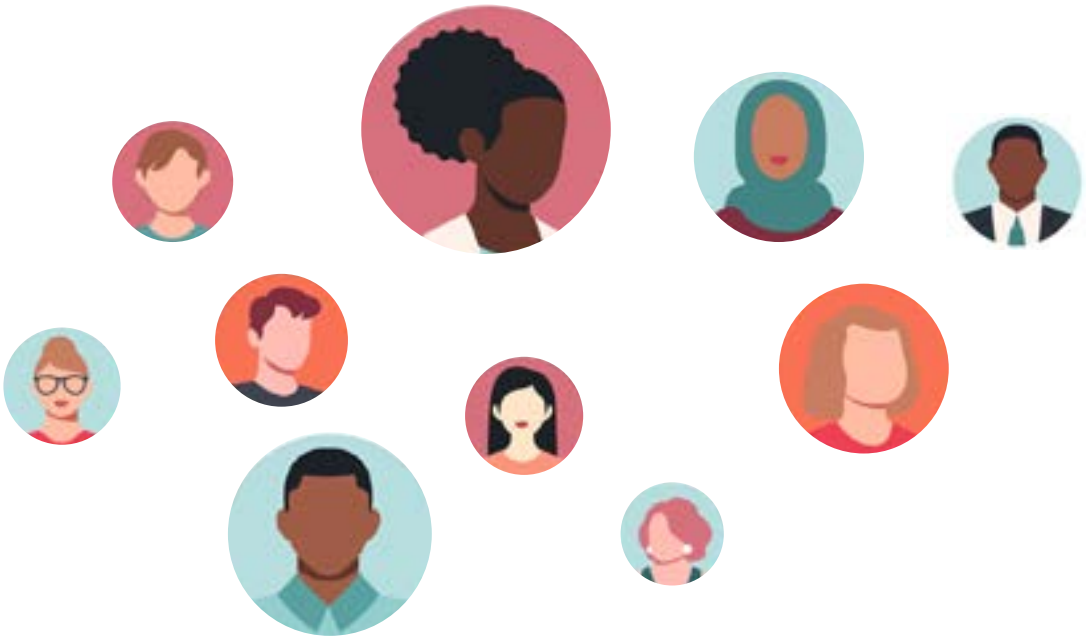
TEACHER-TESTED PRACTICE GUIDES

Presenting Social Justice Data from Trusted, Diverse Sources



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Why This Work Matters

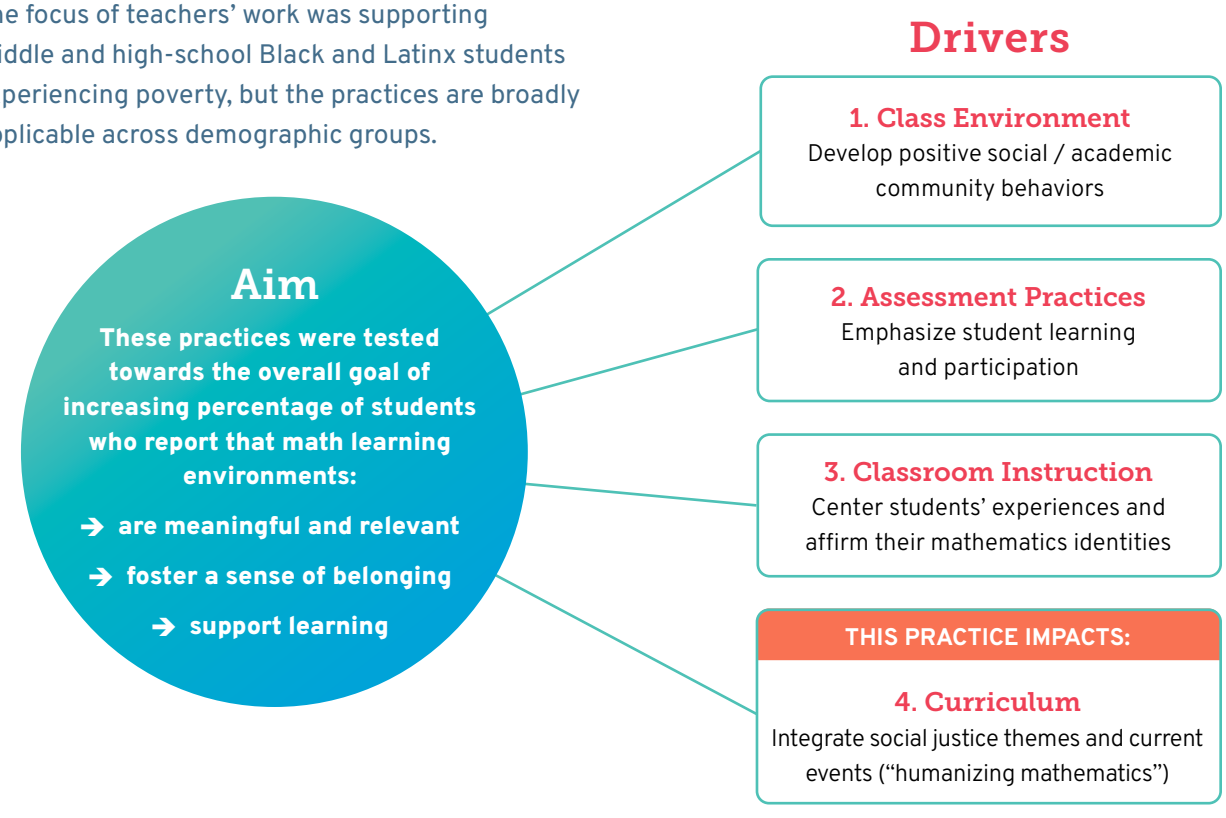
An imperative to center students' experiences in math education

Research points to numerous factors that are instrumental in positive academic outcomes for all students. These include: a positive racial/ethnic identity[1], a sense of belonging[2], and beliefs about their academic abilities[3]. Teachers' expectations are one of the most powerful influences, and these have been found to be lower for Black, Latinx, and Indigenous students due to teachers' biases[4]. Asset-based pedagogy ensures that teachers develop essential knowledge and behaviors that sustain high expectations and promote student identity[5].

This is particularly important in mathematics[6] where some of the most stubborn inequities persist[7]. Special attention is necessary because this subject area has disproportionately negatively impacted students from historically marginalized backgrounds via high-stakes testing, a hyperfocus on skill development, and the abstract nature of the subject disconnected from their day-to-day lives.

However, equity-focused mathematics teachers are innovating and improving ways to support students' identity as math learners, sense of belonging, and beliefs about their academic ability. To learn more about how these practices can be applied in the classroom, Shift partnered with educators across the country to develop a theory of change describing key levers for improving students' experiences in their math classrooms, and to build and test a few of the potentially high-leverage practices they identified. **The purpose of these resources is to provide educators with concrete examples and guidance from educators that have put these strategies into practice in their context.**

The focus of teachers' work was supporting middle and high-school Black and Latinx students experiencing poverty, but the practices are broadly applicable across demographic groups.



Presenting data from trusted, diverse sources to allow students to explore, analyze, and interpret authentic "real-life" data.

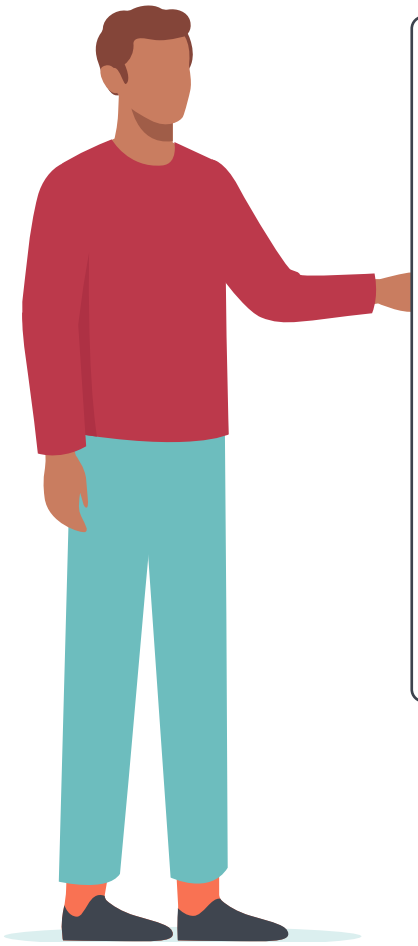
*Special credit and appreciation goes to **Dr. Charles Collingwood** of **Sahuaro High School** who tested this idea in his class in Spring 2022 and contributed to this document.*

1. What it is

Integrating content related to social justice inequities and current events into mathematics curricula can broaden students' perspectives while they master mathematical concepts. Using relevant data from trusted sources around social justice topics and current events makes math content meaningful and thought-provoking for students. The classroom becomes an environment that can promote belonging along with learning—particularly for Black and Latinx students and students experiencing poverty. The goal is to give students a foundationupon which they can gain an understanding of mathematical content through the lens of social justice issues and current events.

To do this, choose from a variety of sources that have high-quality data related to issues important in social justice: institutional and systemic racism and racial discrimination, micro-aggressions, income inequality, poverty, education inequality and inequitable policies.

2. Why do it



Why I do this change

- Students can see a through-line between the analysis of the data and the social effect that inequality has on society
- Students can have a better grasp of social structures and their effect on society with the use of data
- Students can gain a deeper understanding of the lived experiences of some of their classmates, or those whose lives may mirror or be different from their own.
- Students are able to learn about the experience and impact of racism and other social issues from people who experience them, using math skills and concepts to understand how data support these narratives.

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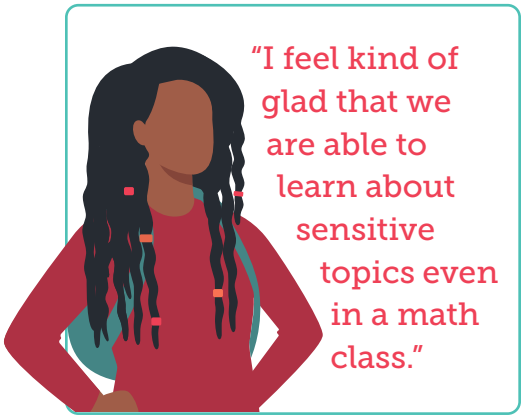
3. How to do it

Before starting, be clear why you want to do this and share your reasons with your students. What are your instructional goals? What questions are you trying to address?



Teacher prep

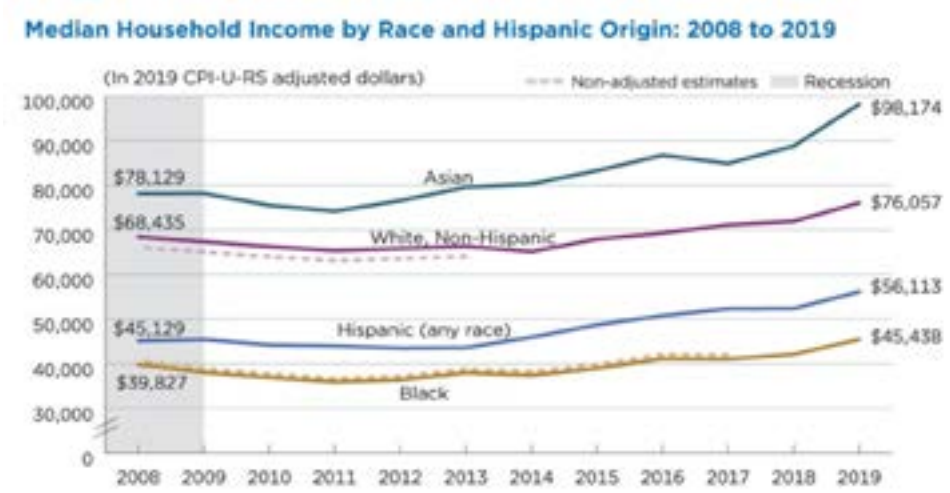
1. Outline the assignment objectives.
2. Identify and integrate verifiable data with your lesson.
3. Clearly tie the social justice topic with the lesson's content and skill objectives (e.g., taking a table of information about different population groups and making an inquiry around the data).
4. Provide prompts like: What trends do you notice? What assumptions can you draw? How does this relate to your experience?
5. Make the assignment time fit the task. Build in sufficient time within the lesson for students to work out the content and re-evaluate their work based on new learning.
6. Provide opportunities for both written and verbal responses, depending on the nature of the assignment.
7. Guide students through how to read different styles of data visualization, like tables, charts, and graphs, so they can learn and apply math literacy skills in the assignment.

Class routine

1. When handing out the assignment, communicate objectives to the class.
2. Ensure the data is accessible to all (website, video, etc.).

EXAMPLE OF INCOME DATA

This example includes data from the U.S. Census Bureau (a reliable source) broken down by Race and Hispanic origin around the social justice issue of income inequality as it affects those from different racial backgrounds.



Source: US Census Bureau, Current Population Survey, 2009 to 2020 Annual Social and Economic Supplements (CPS, ASEC).

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Learning from teacher testing

When testing this change idea in the classroom, it is important to keep these frameworks centered:

- Identity safety
- Cultural relevance
- Growth mindset
- Understanding by Design (Backwards planning)
- Structuring academic conversations

Lessons learned from testing

- Listen respectfully and encourage sharing without judgment to build trust with students to engage in the activity and discussion. Trust-building is critical, but it takes time, so strive for patience and consistency.
- Provide enough **context and background information** so students can provide meaningful reflections (data presented by video may be more salient than in print for some topics).
- Understand that students' responses and opinions will look different depending on their age, maturity, and lived experiences. Take those into consideration when evaluating responses.
- **Model an inquiring mindset** for students; encourage students to find the **why** when making connections between social justice content and mathematical concepts.
- Present/create graphs and/or tables of data so students can look at the data and come up with their own understanding and analysis of the data. Use the **What do you notice? What do you wonder?** as a strategy for your students to make connections.

Possible adaptations and decisions based on class context

- Ask students which topics are most relevant and interesting to them and take these into account when choosing social justice data to incorporate in the math curricula.
- Alternate media/platforms used to present social justice content, e.g., between newspaper articles, online sources, YouTube videos
- Recommend and encourage students to check out podcasts, websites, and other relevant sources of information, to connect the data in your lesson to larger socio-cultural narratives.
- Alternate between written and verbal reflections, so students can participate in ways that feel comfortable and safe.
- Give students opportunities to select their own social justice data for math content.

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Learning from teacher testing

How can a teacher start making this change?

"If a teacher asks me this question, it means that they have a level of consciousness and are willing to investigate this process. To do this type of work a teacher needs to understand why this approach is necessary. This approach must be data driven. I started by looking at the census data as it relates to the disparity in many social determinants that impact academic achievements for minority students. I created graphs and tables of the data so students can look at the data and come up with their own understanding and analysis of the data. I used the "What do you notice? What do you wonder?" format to get students to talk about this issue. In my opinion, this could be very important as it relates to student agency and for some, motivation to do better."

DR. CHARLES COLLINGWOOD, HIGH SCHOOL MATH TEACHER

"WHAT DO YOU NOTICE? WHAT DO YOU WONDER?" STUDENT FEEDBACK FROM CENSUS BUREAU DATA ON MEDIAN HOUSEHOLD INCOME (FROM DATA EXAMPLE):

"I notice that the amount of Household income for the Asian population is increasing more than any other race and that all of them are increasing. I wonder why the income is so much different from each other. I also wonder why there is such a big gap between Hispanic and White."

WHITE FEMALE JUNIOR

"I notice Asian people have the highest median household income. I wonder why Hispanic and Black people have under $60,000."

ASIAN MALE SENIOR

"Black and Hispanic people are dramatically lower in their median household income further proving the relationship between race, poverty, and house ownership. I wonder why Asians are so far ahead compared to rest of the races in terms of median household income."

MEXICAN AMERICAN MALE SENIOR

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SEASONALITY:
These activities work best when there is a degree of trust established with students such that they're willing to be vulnerable; these activities also create opportunities to build that kind of trust among students. Take time to build out and scaffold these activities over the term to create multiple opportunities for building trust among students. Start with observational activities (e.g., What do you notice?/What do you wonder?), then delve into more introspective exercises (i.e., how social justice issues affect them or those they know personally).

Suggested Measures

- Get a baseline % for your class around a few key indices (awareness about particular social justice issue, how these issues affect them or loved ones personally, how these issues affect long-term goals, etc.). Ask the same questions at the end of the unit or term for a pre- and post-analysis, or regularly throughout to chart the perception data over time
- Use qualitative and quantitative data (e.g., from assignment reflections, surveys, and/or exit tickets) to gauge student impressions about lessons. If possible, note racial/gender identification (de-identified) with responses to understand patterns across and between student groups
- If you teach different grade levels, try testing similar social justice content with the math content for each class to gauge differences in student reflections. For example, compare responses from your freshman Algebra 1 class with your college algebra class

Connection to the Theory of Change

Driver 4: Integration of social justice inequities and current events into existing curriculum ("humanizing mathematics")

Change Concept: Bridge current events and social justice themes with math content

Want to learn more about other drivers and changes?

Change Package

Theory of Change

Defining Our Terms

Theory of Change

A Theory of Change is a description of how we believe change (or improvement) will happen; illustrating how our collective actions will lead to the desired outcomes.

Aim

An Aim is a shared goal of an improvement initiative that is 'SMARTIE', i.e. specific, measurable, actionable, realistic and time-bound as well as inclusive (with whom) and equitable (for whom).

Drivers

Drivers describe the main factors, leverage points, and/or ideal conditions that would need to be present to accomplish the aim of an improvement initiative.

Change Ideas

Change ideas describe how you might create the conditions described in your drivers in order to accomplish the aim.

Change Package

A Change Package is both a collection of consolidated learning arising from testing change ideas in a theory as well as a resource for those who wish to test and adapt these change ideas.

Appreciation and References

Thank You

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We also wish to thank Dr. Francesca Lopez and Dr. DeLeon Gray for their many contributions.

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