

ON MINDSET AND PRACTICES FOR RE-INTEGRATING **BELONGING** INTO MATHEMATICS INSTRUCTION

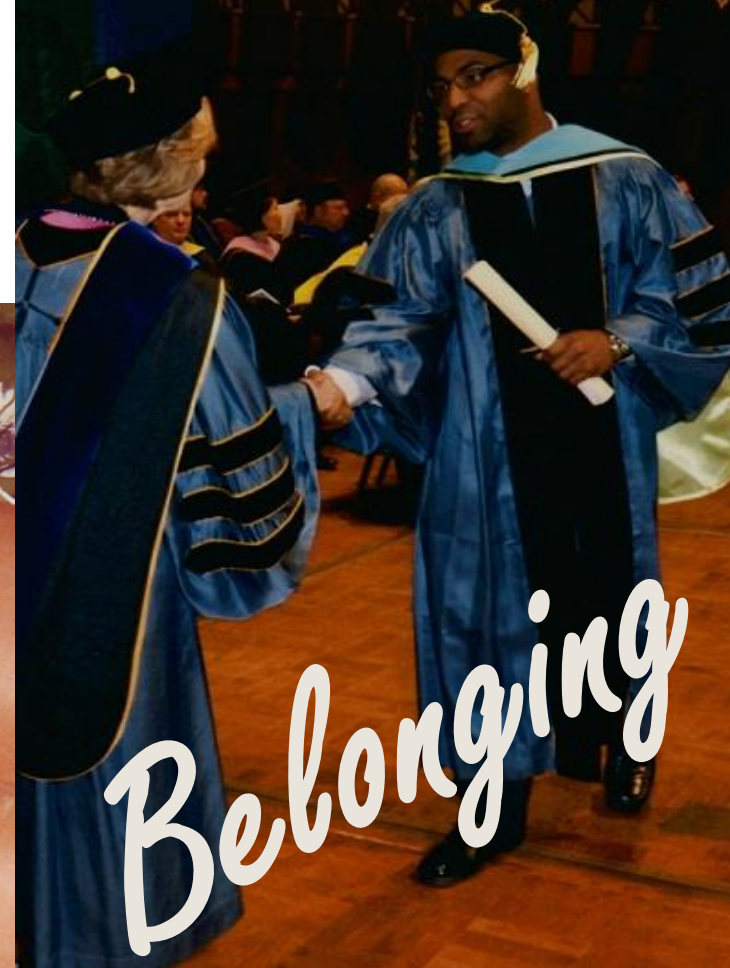
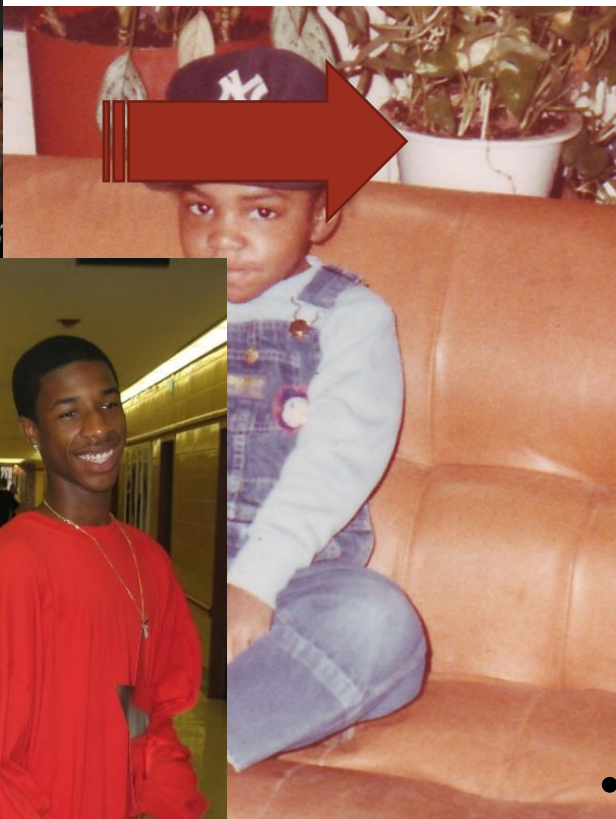


J. Sharif Matthews Ph.D.

 #Worthy2Belong

A ROADMAP

- **The Importance of Belonging**
 - Assaults on belonging
- **Mindsets for Belonging-centered Practices**
 - Critical awareness
 - “Seeing” students through empathy
 - Allies vs. Savors
- **Practices for Re-integrating Belonging into Math Instruction**
 - Coordinating & adjusting instruction for connection to students’ lives (HLP #6)
 - Analyzing instruction for improvement (HLP #19)

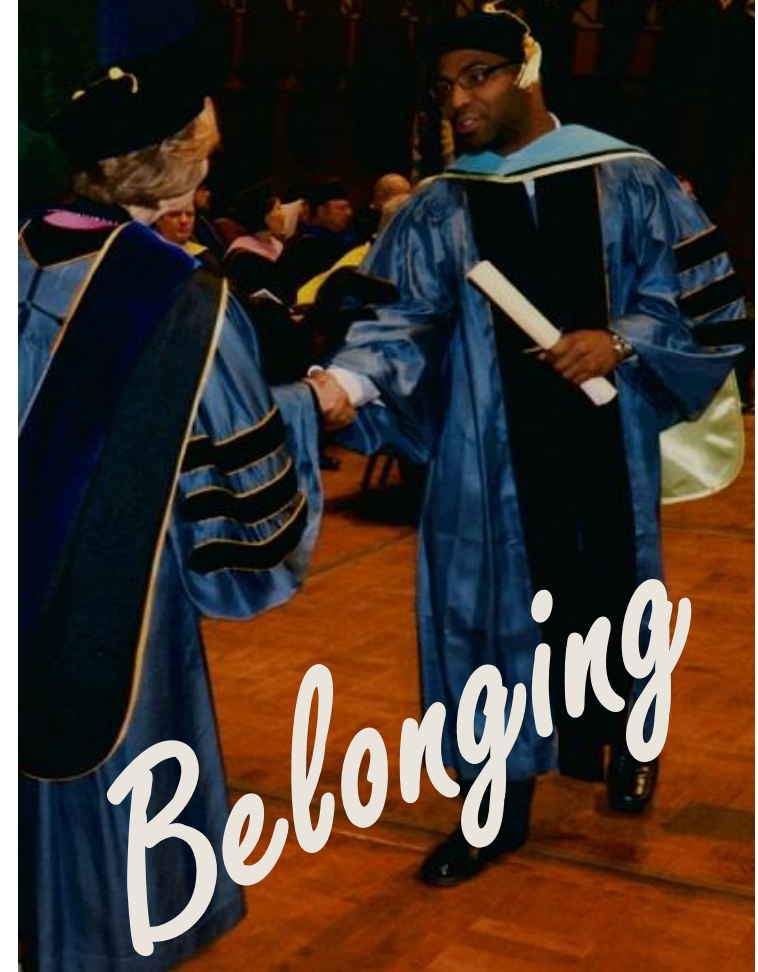


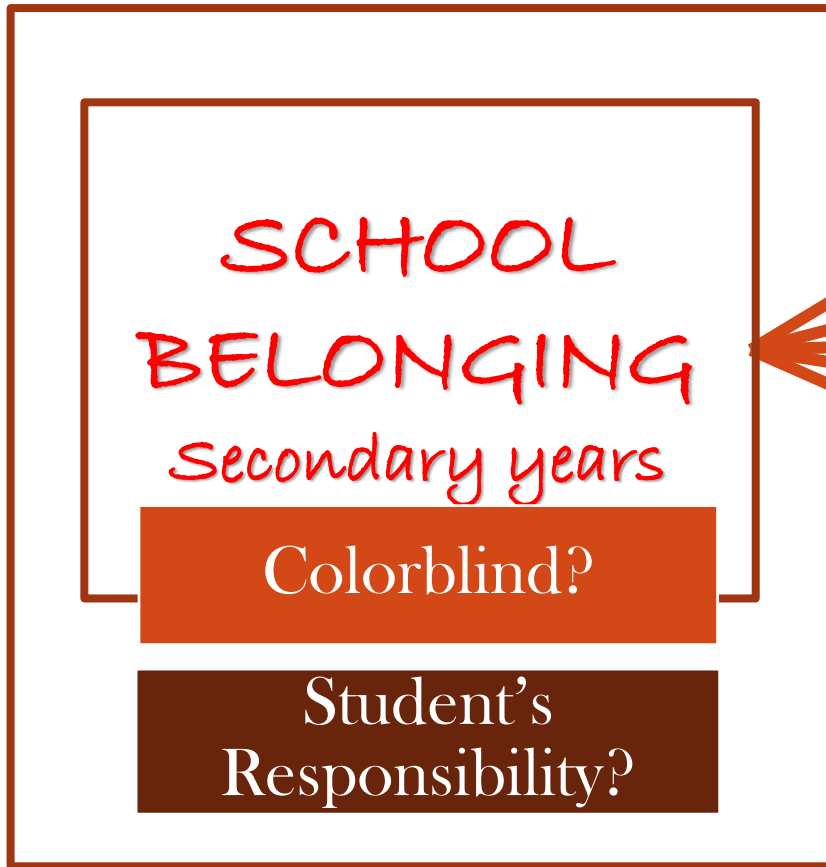
Academic Motivation

- More efficacy
- Better meta-cognitive awareness
- Greater self-regulation
- Self-determination Theory
- Attribution Theory



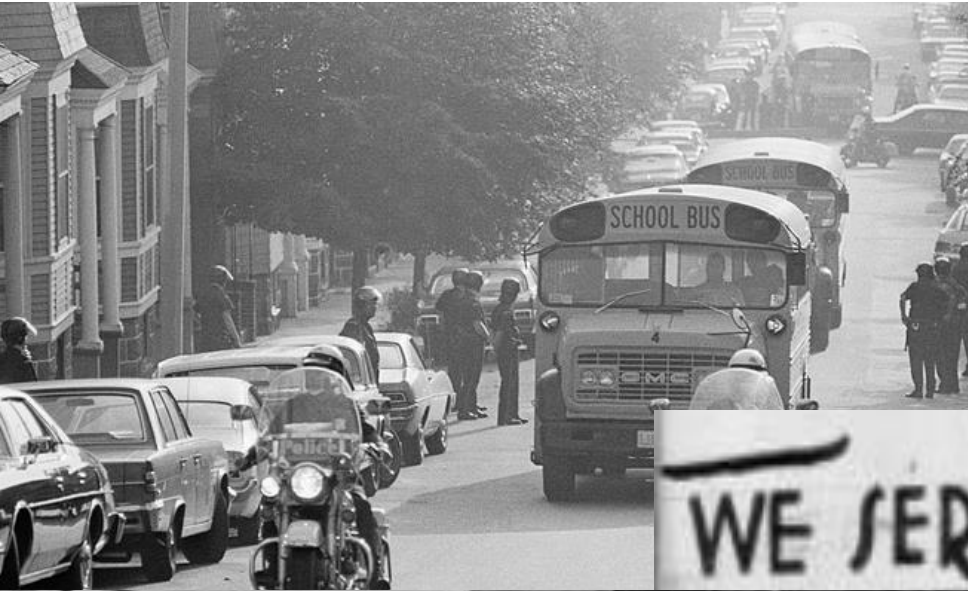
- A fundamental human need
- A source of motivation & worth
 - Related to emotional health
- Belonging stress can impede cognition





*How do we support belonging within
an educational system that never
intended for Black, Brown, and poor
children to belong?*





More Than 27,000 Black Students In The U.S. Attend Schools Named For Confederates

Enrollment by race/ethnicity, 2014-2015 school year*



When Black Hair Violates The Dress Code

July 17, 2017 · 5:45 AM ET

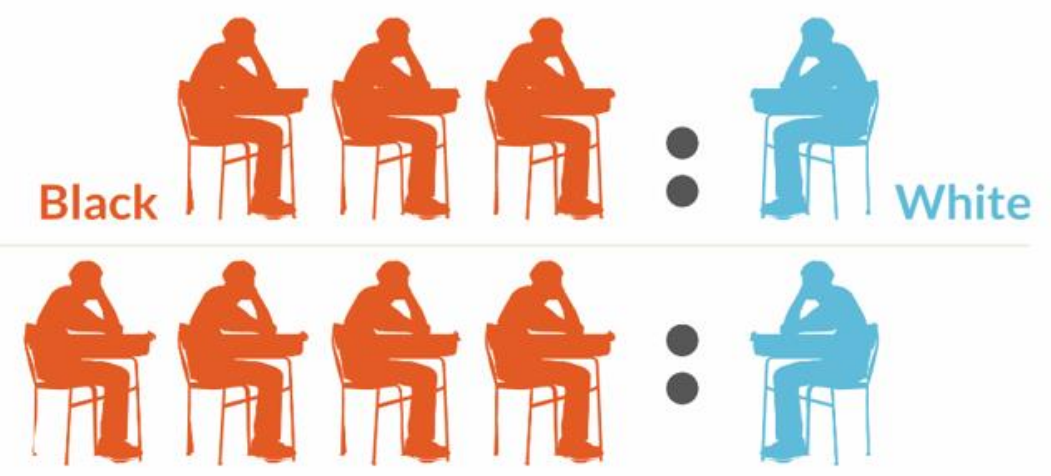
KAYLA LATTIMORE



The uncomfortable truth about race in N.J.'s top high schools

Disparities in School Discipline

Students are 3-4 times more likely than their white peers to be suspended or face multiple suspensions from school.



U.S. Department of Education, Office for Civil Rights, Civil Rights Data Collection, 2009-10

ASSAULTS ON BELONGING

- Pedagogy of Poverty (Haberman, 1991)
- Schooled for 2nd class citizenship
- Real education is for the privileged
- This student realized:
 - “*We’re not being considered*”
 - “*This is not for kids of color*”
 - “*We’re being taught to hold open doors*”



SIGNAL INFLUENCES (MCKOWN, 2013)

- Teachers & curricula are often unconscious perpetrators of the assault on belonging
 - “*My teacher asks me easier questions than other students*”
 - “*My teacher prefers the textbook method instead of mine*”
 - Interests/experiences of students are not reflected in content
 - Contributions from the people group of students is absent
- In mathematics “correctness” signals belonging

“I’M NOT A MATH PERSON”

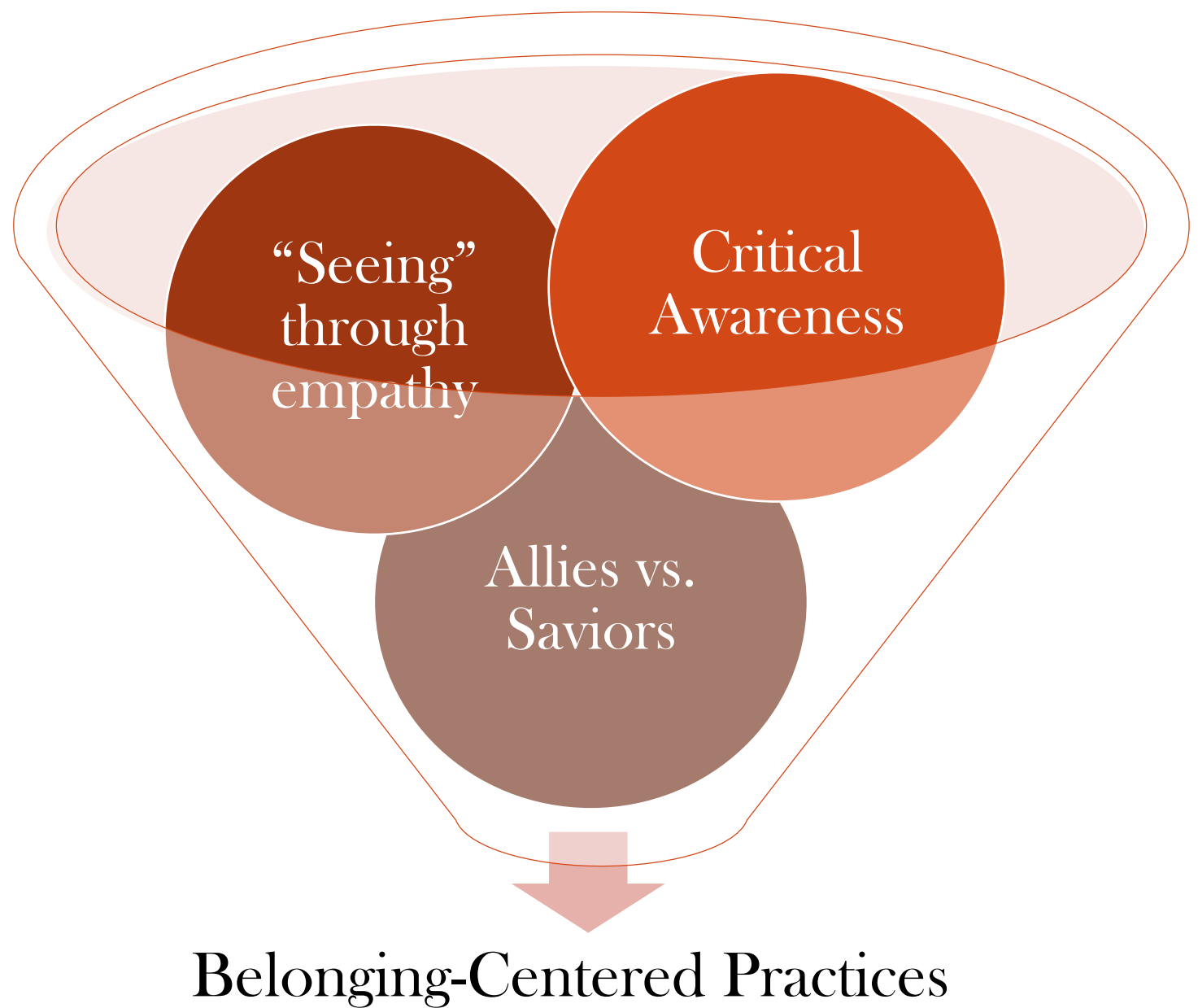
- *Like I don't see why we need equations in life, graphing. I understand if you want to work with math; a math teacher, engineering, or like a scientist you need to know that stuff. **But I don't want to deal with nothing that has to do with math.***
 - *Nina, Latina female, 9th grade*
- *I don't think that math is useful outside of the classroom.... I don't understand what tables and graphs have to do with going out of school and living everyday life. I understand the future when you get certain jobs and stuff, but for now I don't think it's worth it.*
 - *DaShane, African American Male, 9th grade*



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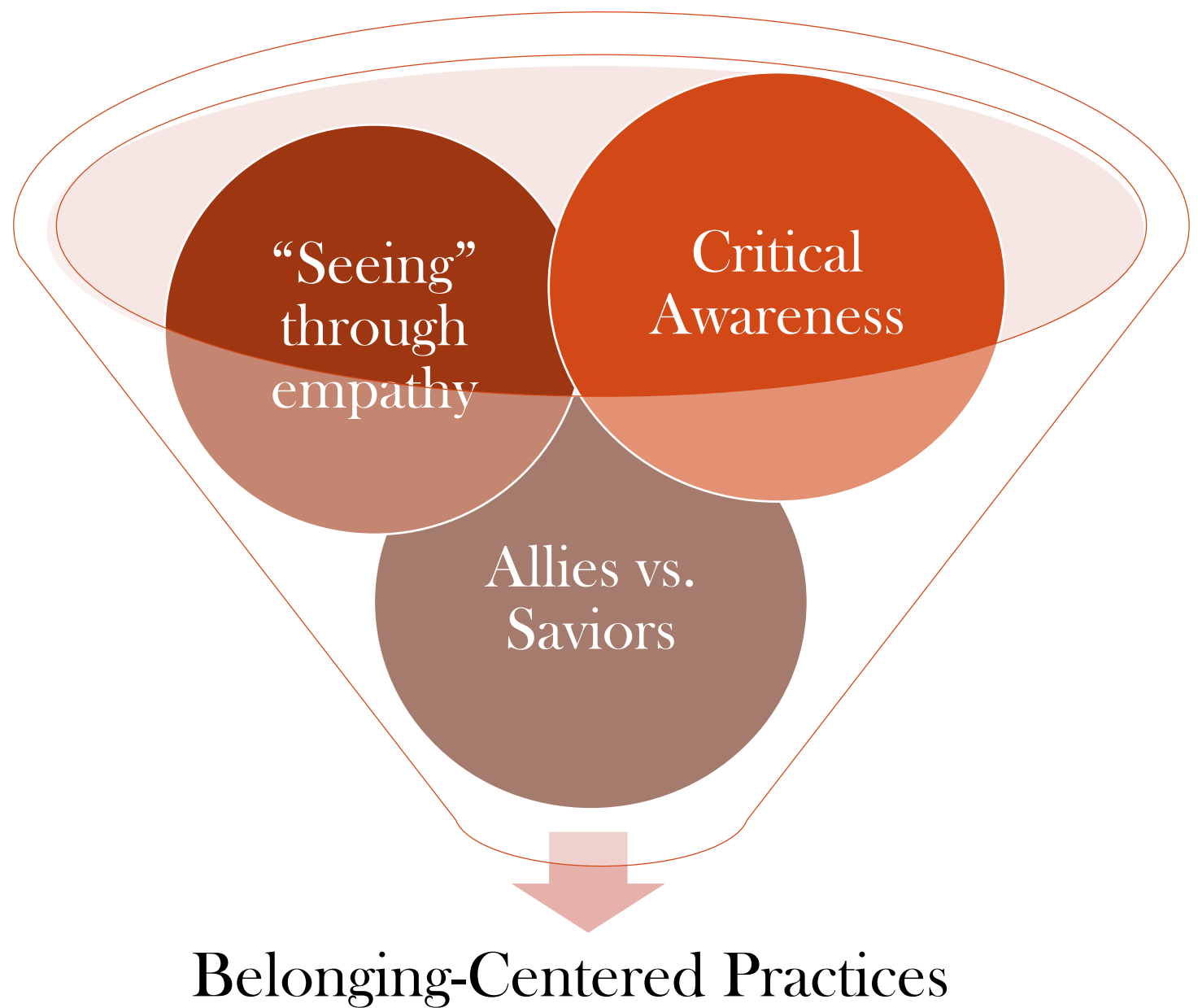
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TEACHER MINDSETS





TEACHER MINDSETS



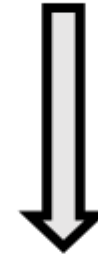
CRITICAL AWARENESS

- Understanding the historical context of disenfranchised youth
- What is knowledge & who has it?
- Maintaining status quo replicates current power structure

High
Expectations



Critical
Awareness



Culturally
Responsive
Instruction

“SEEING” THROUGH EMPATHY

Seeing

- Beyond student attributes
- Multiple facets of the person
 - Strengths
 - Frustrations
 - Emotions
 - Aspirations

Through Empathy

- Evaluating them through the complex lens that you would evaluate your own behavior or that of someone you love



ACTIVE



“SEEING” THROUGH EMPATHY

...she was like "I know, I get it, I've always failed math, I'll just do summer school". She's already in her head gonna take algebra II in summer school... "Don't you want your summer, though? You're a junior, how old are you? When's your birthday?" **Found out she's a Sagittarius and I go "Oh me too!" tried to - you know, try some kind of connection,... Found out she likes English, she's doing well in her English class.** So, Ms. [teacher name], who's well-read, I don't like to read, suggested this book that she thought that any teenage girl would like. So I borrowed the book and I gave it to [student name],... **I read the book just so I could have a book club talk with her**, never read the book. Just gave it back to me...nothing worked. Um, what else did I try? ... **like, just anything, anything outside of class just to find something that would make her smile and see that I'm human, I'm not just here to give you a grade...**



ALLIES VS. SAVIORS

See paper @ TeachingWorks.org



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4H_s OF BELONGING-CENTERED INSTRUCTION



■ Home



■ Hobbies

■ Hopes



HIDDEN
FIGURES



■ Heritage



MATH INTEREST INTERVIEWS ↔ 4Hs

Interviews w/ your students about math & real life

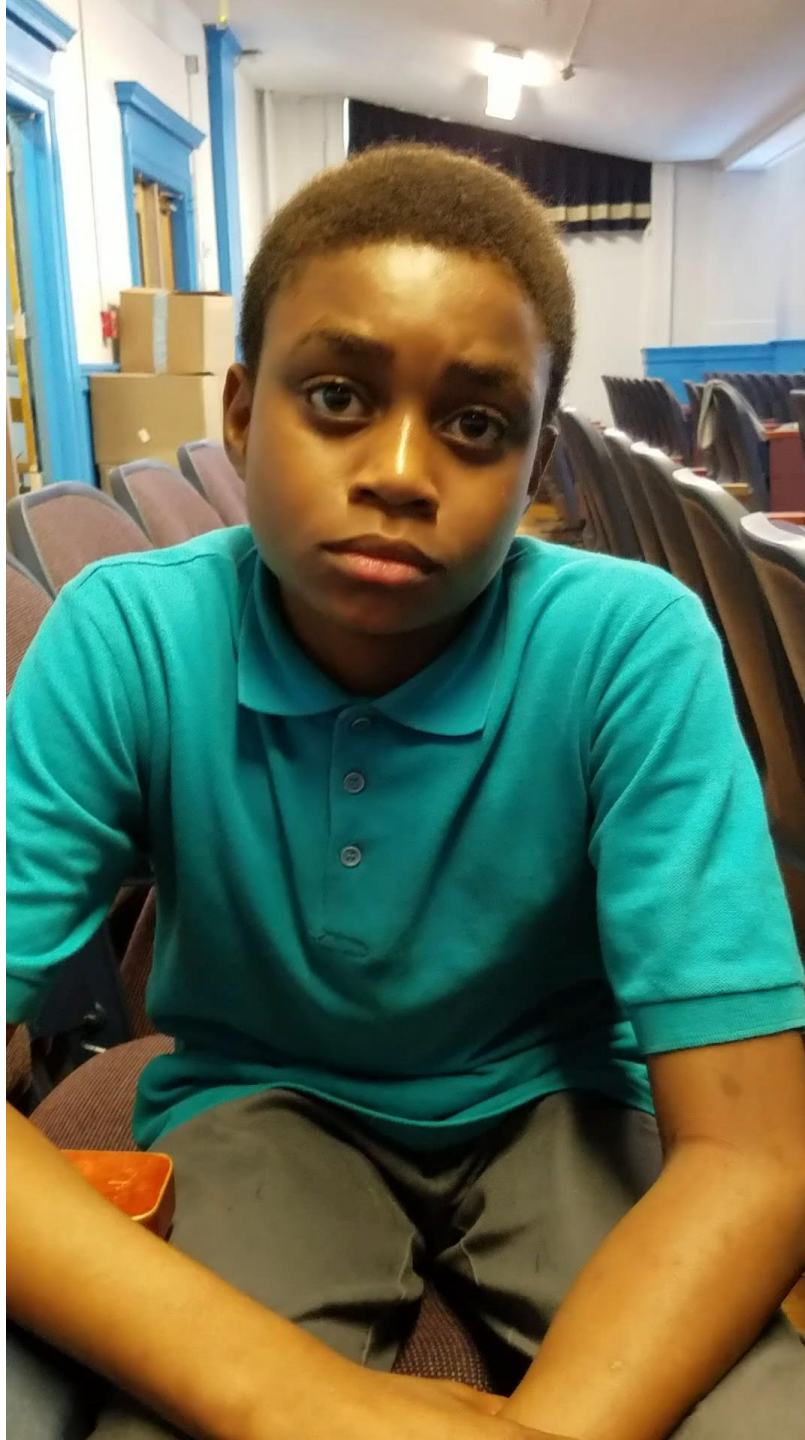
- 1) Assign the questions for homework
- 2) Student-pairs video each other w/ their phones
- 3) Submit videos to teacher for credit
- 4) Instant “data” about your students
- 5) Organize data into 4H categories
- 6) Use data as repository to build examples throughout the school year



(Walkington, Sherman, & Howell, 2014)

MATH INTEREST INTERVIEWS ↔ 4Hs

This activity is more than just “getting to know” students, it is geared toward showing them that **their knowledge and experiences are important to your instruction** and their own learning





1) 2) 3)

A B A B A B

1. For each grid how many possible paths are there from A to B?

2. Is there a relationship between grid size and the number of potential paths from A to B?

4Hs Weekly Reflection Worksheet

Keep track of how often you provide mathematical applications to the 4Hs of your students.

See how you are progressing week-to-week!

Directions: For each application item, on each day, rate yourself on the scale:

Did not Attempt	Attempted	Attempted Partially Successful	Attempted Highly Successful
0 pts	1 pts	2 pts	3 pts

WEEK OF:		CLASS:					
	Daily Rating					Weekly Total	Notes on connections to 4H
Word Problems	Monday	Tuesday	Wednesday	Thursday	Friday		
Teacher analogies	Monday	Tuesday	Wednesday	Thursday	Friday		
Analysis of real data	Monday	Tuesday	Wednesday	Thursday	Friday		
Discussions of math in society	Monday	Tuesday	Wednesday	Thursday	Friday		

4Hs WEEKLY REFLECTION SHEET



“FINISHING” WORD PROBLEMS

In June, 2007 Steve Jobs introduced the first version of the iPhone for \$499. This was the first smart phone ever released by Apple. In 2017 the iPhone 7 *Plus* was the latest model and was priced as \$769. What has been the percent increase on the price of the iPhone from 2007 until 2017?

Model how you would solve this problem, solve, and explain



“FINISHING” WORD PROBLEMS

To ‘finish’ a word problem is to explain it conceptually and contextually, not just procedurally.

Typical word problem protocol:

- 1) Reading closely to determine the appropriate info & procedure
- 2) Model the problem mathematically; extract the numbers; set up equation
- 3) Solve the equation; Compute → Answer
- 4) Re-insert the answer → WP to interpret conceptual & contextual meaning



“FINISHING” WORD PROBLEMS

So what does a 54% increase in the iPhone actually mean?

- It means I could buy 1 ½ iPhones 10 yrs ago for the price of 1 iPhone today!!
 - Is that fair? What might be some reasons that explain this?
-
- Inflation: Money is worth less than it was in the past, therefore you need more money to buy the same things now
 - Apple Markup: Apple realized that they have a really popular product so now they are able to charge more money for it
 - Better Product: Maybe today's iPhone is actually 54% better than it was ten years ago (faster, more options, more storage space).





Drs. Ball & Goldin @ TeachingWorks

Principals, Teachers and Students @ NPS

Newark Identity Project Team

National Science Foundation – DRL



- “Relevant” Word problems (e.g., “Shirts are 15% off and pants 20% off at...”)
- Teacher analogies (e.g., relating pizza pies to percentage charts)
- Discussions of math in society (e.g., using statistics to discuss the popular vote versus the electoral college vote in the 2016 election)
- Analysis of real data (e.g., collecting classmates’ data to see the relation between height and shoe size)
- Tangible math representations (e.g., algebra tiles)
- Mathematical modeling of real world phenomena (e.g., an equation to represent the relation between years of education and money earned)

