

BranchED Fall 2022 Summit: Day 2

# Math as a Superpower: Turning Mathematics from a Phobia to an Asset



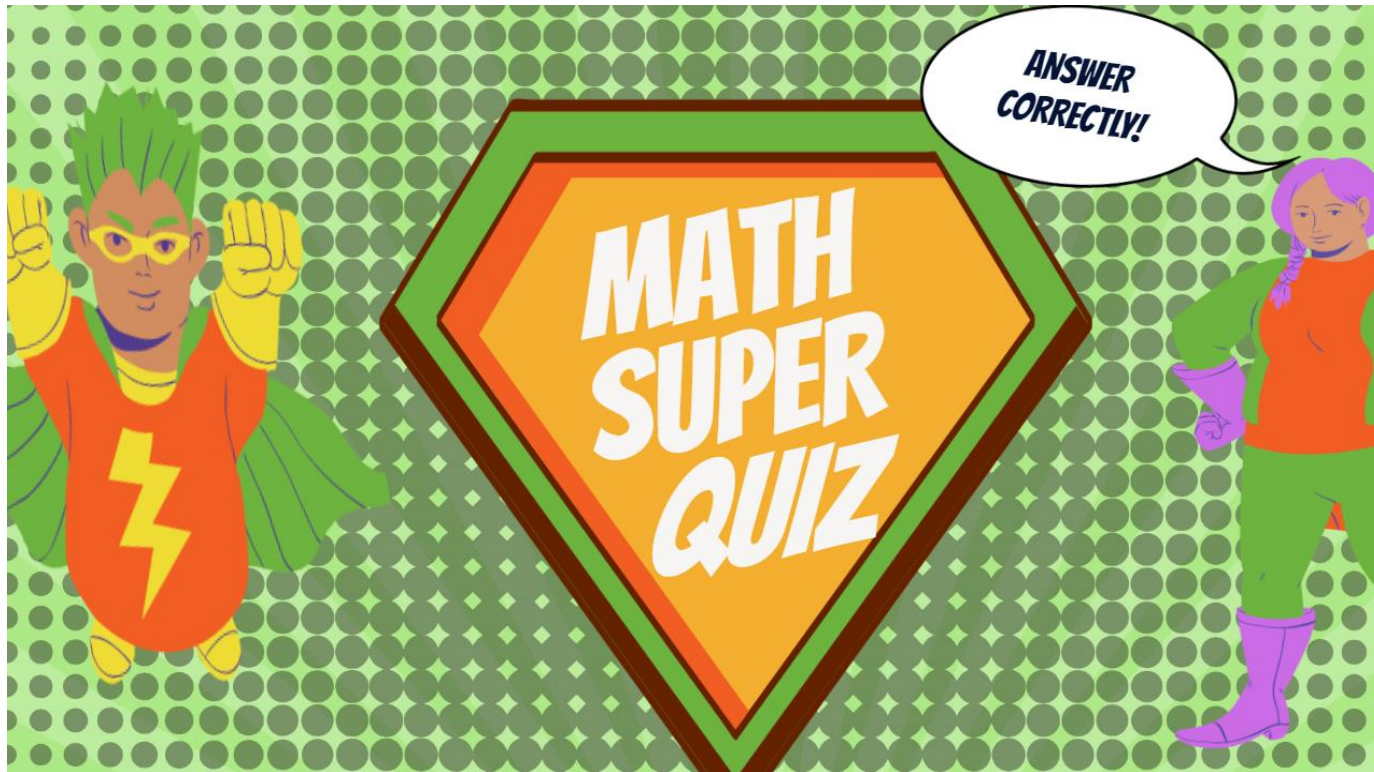
**Branch Alliance**  
for Educator Diversity

# Agenda

- Connector and Pulse Check
- Your Why
- The District's Why
- More about Math Identity
- Connecting to Your Practice
- Math and Transformational SEL
- Current Issues and Trends
- Challenges and Ways to Dismantle Them
- Real World Problems
- Revisiting your Practice



**Branch Alliance**  
for Educator Diversity



**Branch Alliance**  
for Educator Diversity

Connector



**SCAN ME**

# Your feedback



**Branch Alliance**  
for Educator Diversity



A word cloud featuring various positive adjectives. The word 'engaging' is the largest and most central, rendered in blue. Other prominent words include 'reflective' (red), 'fun' (pink), 'thought provoking' (yellow), 'energetic' (blue), 'amazing' (red), 'enlightening' (pink), 'creative' (blue), 'insightful' (brown), 'empowering' (blue), 'thoughtful' (brown), 'exciting' (blue), 'informative' (pink), 'interesting' (red), 'entertaining' (blue), 'collaborative' (blue), 'informed' (green), 'affirming' (green), 'energizing' (green), 'motivating' (yellow), 'enthusiastic' (green), 'grateful' (yellow), 'excited' (blue), 'reminiscing' (red), 'awesome' (brown), 'learning' (green), 'interactive' (blue), 'passion' (blue), 'wonderful' (yellow), 'powerful' (pink), 'eye opening' (pink), 'revealing' (yellow), 'fantastic' (blue), 'unusual' (blue), and 'supportive' (blue). The words are arranged in a circular pattern around the central 'engaging' word, with varying sizes and colors.

engaging

reflective

fun

thought provoking

energetic

amazing

enlightening

creative

insightful

empowering

thoughtful

exciting

informative

interesting

entertaining

collaborative

informed

affirming

energizing

motivating

enthusiastic

grateful

excited

reminiscing

awesome

learning

interactive

passion

wonderful

powerful

eye opening

revealing

fantastic

unusual

supportive

Keep up the great work! You all are amazing, as always.

Nothing! The positive energy is outstanding!!!

I do not have any suggestions for improvement.

Chocolate chip cookies?

Nothing

None. Y'all do a great job with varying activities to keep us engaged. The day flew by. Loved the learning.

This is my first experience and everything is great !

Everything is fine.

Life is good at the moment

Great job!

None at this time

I think an audio cue for coming back together or calling attention would be helpful. Either a clap or a bell or a little melody :)

The positive energy is outstanding!!!

Make it a continuation of today's session

More getting up Sitting too long is hard

Looking forward to guest speakers but please share resources links Prior so we can review and ask questions

Pleaseee keep the same great level of energy! So far, AMAZING

So far so good in my eyes. Continuing to allow participants to share thoughts and feelings are always good.

Don't change anything

It's great!

I am really looking forward to tomorrow and learning what all this means in terms of preparing math teachers to tackle the situations we discussed with regard to our and students math identity.

Everything is going great! Repeat tomorrow!

Please have ice for drinks. All is outstanding

Shared in priir response

The sessions were wonderful. I like sharing my experiences with my group

Ask for leaves and tweets before break

N/a

Keep it engaging like today and allow us to share our expertise with each other and the group.

Thank you for all of your effort. It's been great!

I really enjoyed the collegial atmosphere.

N/a

Maybe a designated five minute bio-break so you don't miss something while going to the restroom

?

All was good.

Opportunity to share strategies for teaching math concepts. Opportunity to share ways to assess math



# Summit Webpage



<https://www.educatordiversity.org/fallsummit/>

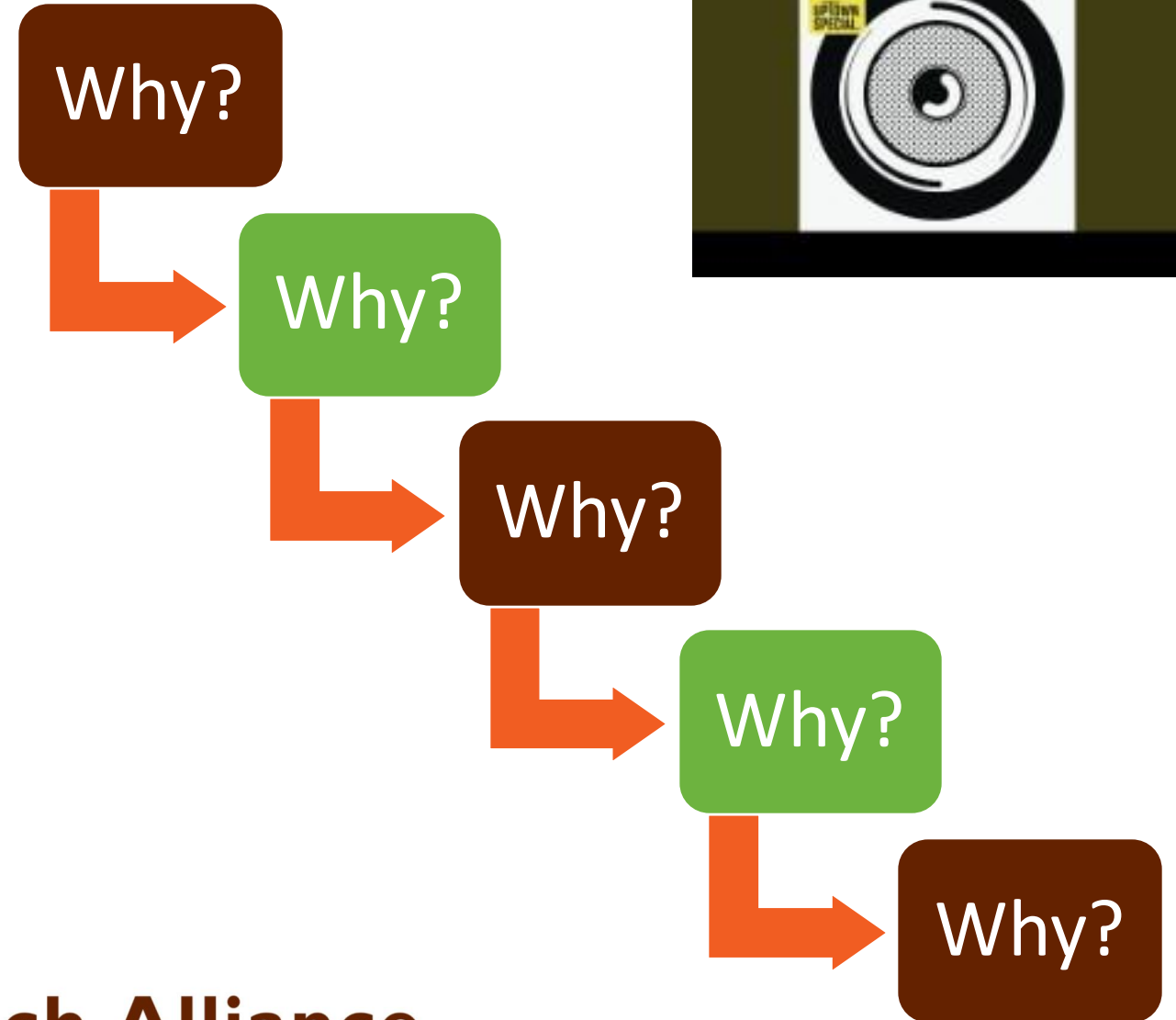


# Your Why

- Musical Chairs
  - When the music stops turn to the person closest to you
  - Determine your partner's WHY for being here using the 5-Whys Framework
  - Select the One Main Why for each of you and post on the Tree of Knowledge
  - Share out

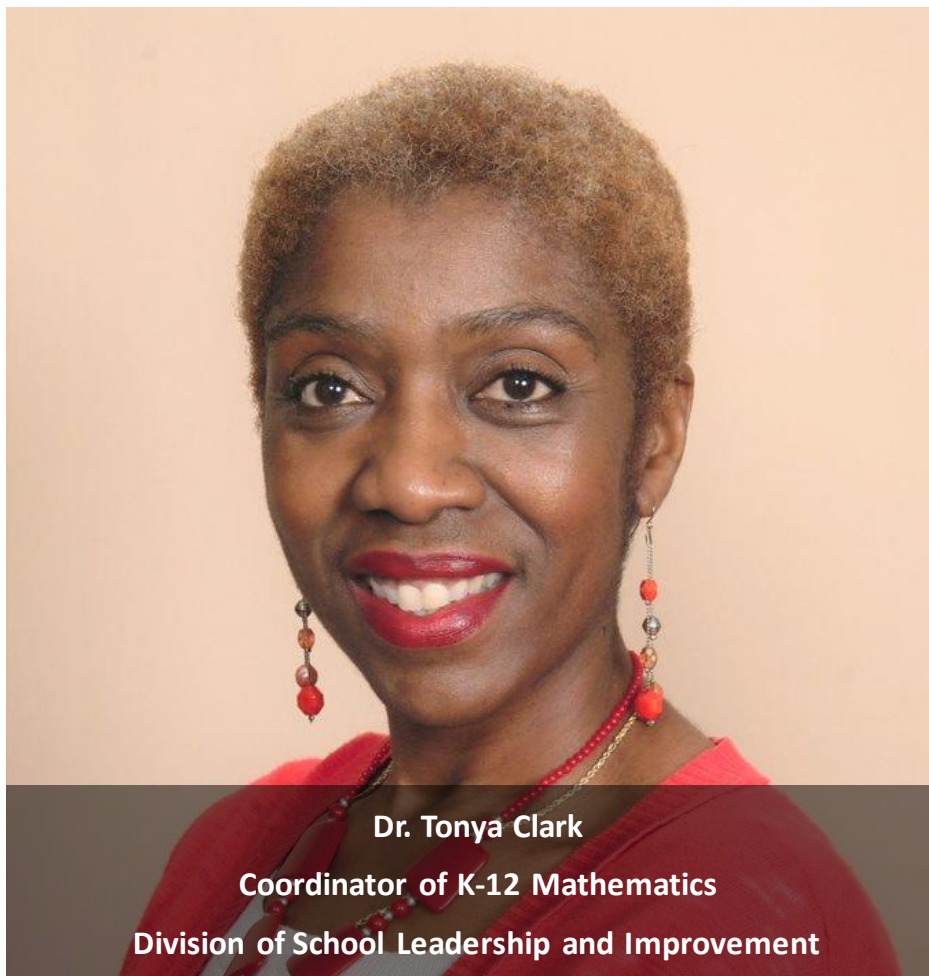


**Branch Alliance**  
for Educator Diversity





Dr. Valeisha Ellis  
Assistant Professor  
Spelman College



Dr. Tonya Clark  
Coordinator of K-12 Mathematics  
Division of School Leadership and Improvement

# Facilitators



**Branch Alliance**  
for Educator Diversity

# District's Why



## Teacher Data

- Assessments administered to teachers in 2015, 2016, and 2017
- Average score in 2015 were 66% (elementary), 67% (middle), and 75% (high)
- Average score in 2017 were 80% (elementary), 85% (middle), and 80% (high)
- Data from observations also showed limitations in instructional implementation

## Teacher Responses

- “I did not learn it this way”  
[referring to hands on, real world, math teaching that is not direct instruction]
- “I don’t see how this relates to mathematics”
- “I don’t know how to do it any other way”



What do we currently know about math identity?



**Branch Alliance**  
for Educator Diversity

# Mathematical Proficiency



## Conceptual Understanding

Understanding concepts, operations, and relations



## Strategic Competence

**Formulating, representing, and solving problems**



## Productive Disposition

**Seeing math as sensible, useful, and worthwhile**



## Procedural Fluency

Using procedures flexibly, accurately, and efficiently



## Adaptive Reasoning

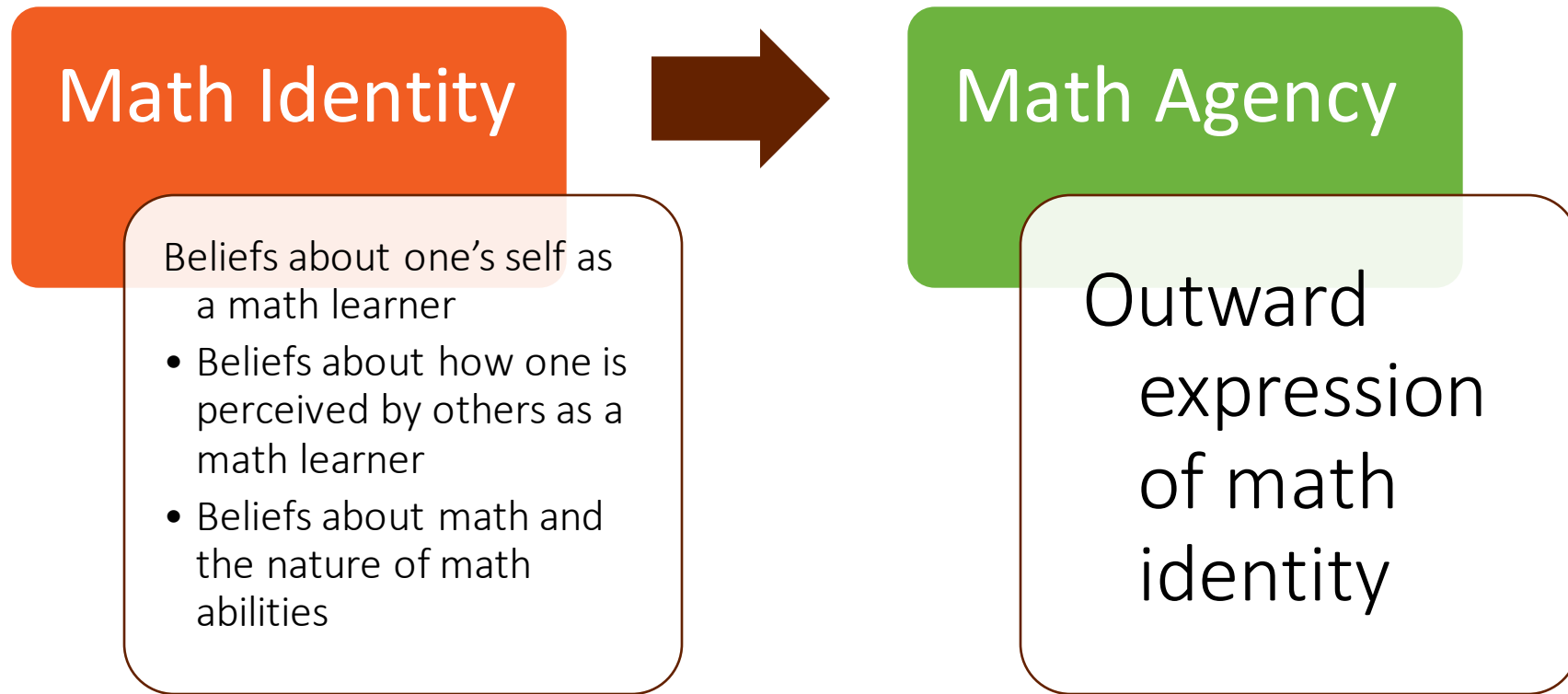
**Reflecting, explaining, and justifying**



**Branch Alliance**  
for Educator Diversity

Kilpatrick, Swafford, & Findell, 2001  
Adding It Up p. 116

# Elements of Math Success





**Branch Alliance**  
for Educator Diversity

# Why should we care about identity and agency?



Math Identity



Math Agency



Math Success



## Prevalence of Math Negativity



**Branch Alliance**  
for Educator Diversity

93%

Report experiencing some level of math anxiety

59%

Report worrying math will be difficult

33%

Report they get very tense when completing  
math homework

31%

State they get very nervous doing math  
problems

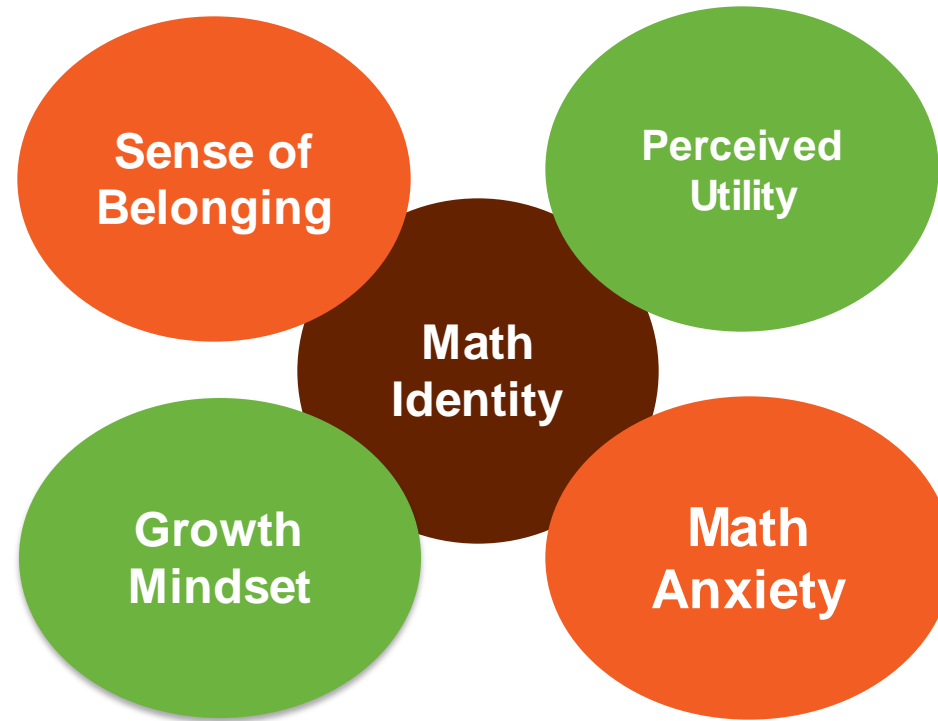
# Gender Stereotypes Emerge Early



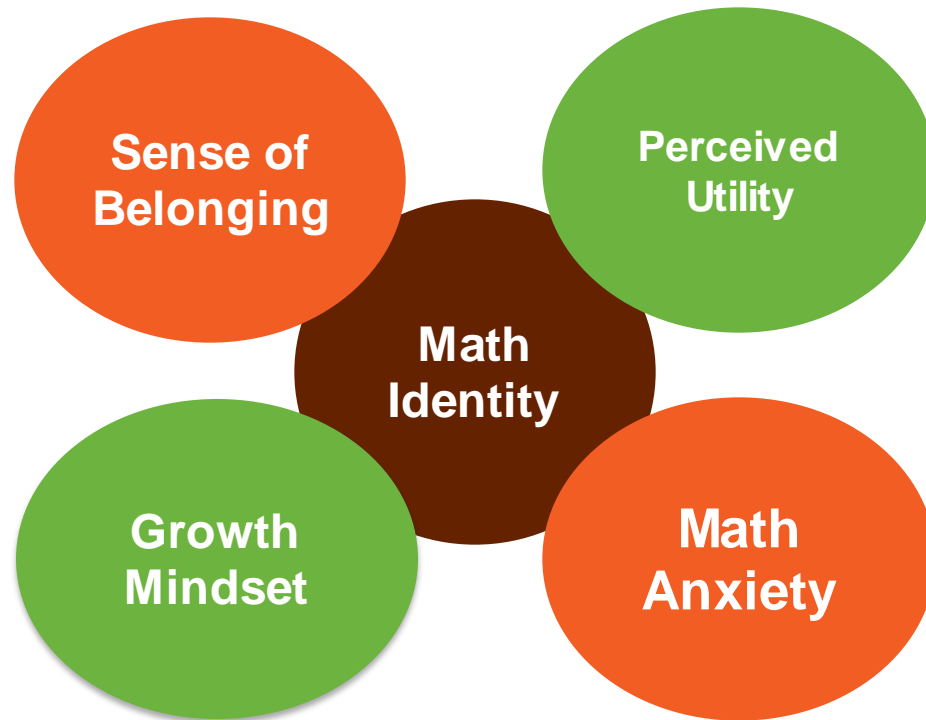
- Gender stereotypes emerge **BEFORE** differences in math achievement.
- Children endorse “Math is for boys” as early as second grade...

Chestnut, Lei, Leslie, & Cimpian, 2018; Marsh, 2014;  
Correll, 2001; Bian, Leslie, & Cimpian, 2017

# Key Components of Math Identity



# Key Components of Math Identity

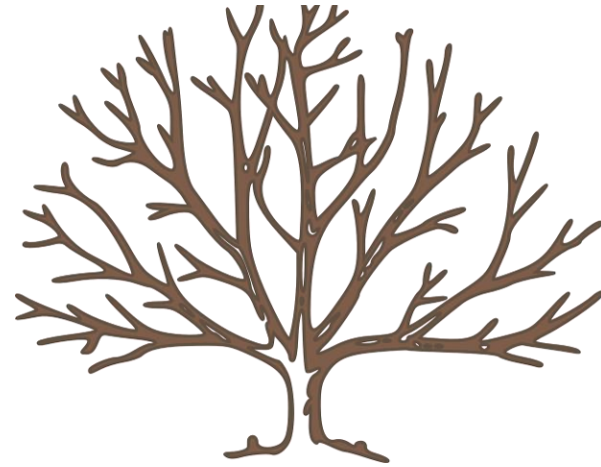


COMMON CORE MATHEMATICAL PRACTICE STANDARDS		
1	I can make sense of problems and persevere in solving them.	
2	I can reason abstractly and quantitatively.	
3	I can construct viable arguments and critique the reasoning of others.	
4	I can model with mathematics.	
5	I can use appropriate tools strategically.	
6	I can attend to precision.	
7	I can look for and make use of structure.	
8	I can look for and express regularity in repeated reasoning.	



**Branch Alliance**  
for Educator Diversity





**Branch Alliance**  
for Educator Diversity

# Break

---

Back in 15 minutes

# Connecting to your Practice

- Identify a math assignment or activity that you would consider an exemplar

What does it entail?

What are the objectives?

What are the outcomes?

How do you know?



**Branch Alliance**  
for Educator Diversity





# Quick Share Out

Ideas to Add to Your Toolkit



**Branch Alliance**  
for Educator Diversity





**Branch Alliance**  
for Educator Diversity

# Math and Transformational SEL

Why it is important!





# Solve

$$2 + 2 = 8$$

$$3 + 3 = 18$$

$$5 + 5 = 50$$

$$6 + 6 = 72$$

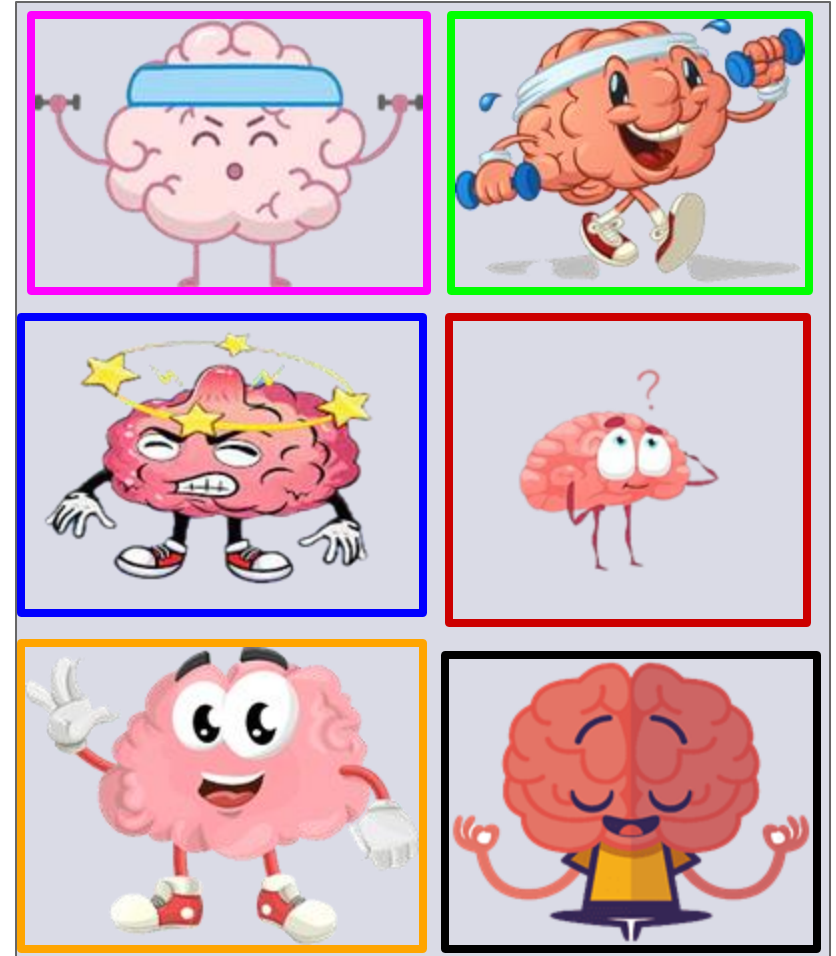
$$10 + 10 = ?$$



Which one of  
these best  
represents  
what your  
workout was  
like?



**Branch Alliance**  
for Educator Diversity



# Solve: Ready –X1

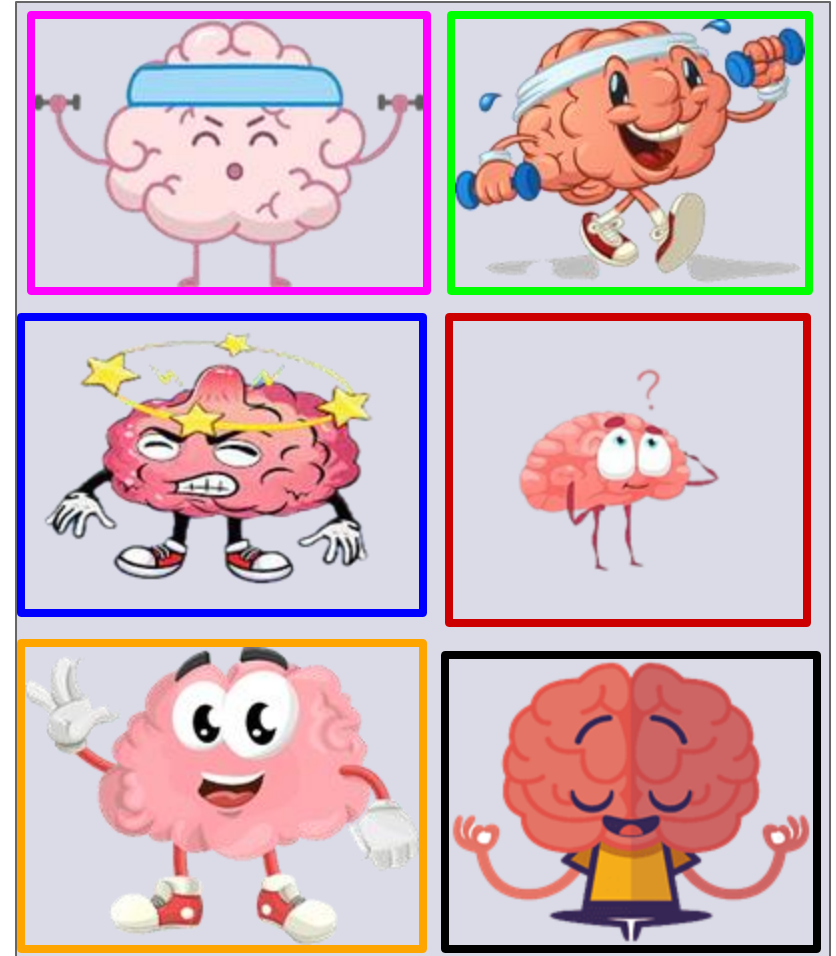
Columns					
Rows		1	2	3	
	1	R	X	E	17
	2	D	X	D	13
	3	Y	X	A	17
	4	D	X	E	14
		22	12	27	



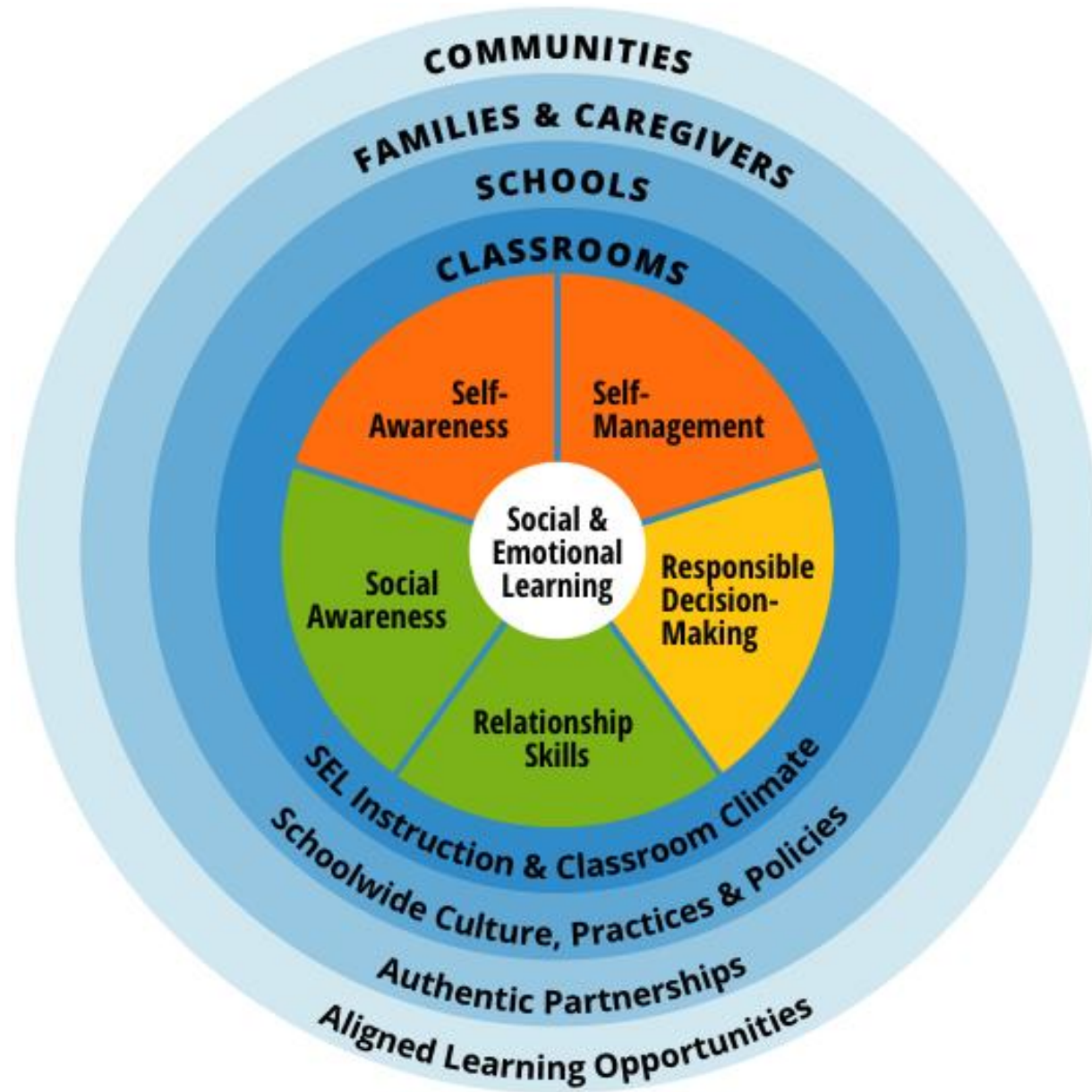
Which one of these best represents what your workout was like?



**Branch Alliance**  
for Educator Diversity



R=\_\_\_ E=\_\_\_ A=\_\_\_ D=\_\_\_ Y=\_\_\_ X=\_\_\_



What did you notice about yourself and others as you worked these problems?



**Branch Alliance**  
for Educator Diversity

Where did the  
emphasis on SEL  
begin?



**Branch Alliance**  
for Educator Diversity

**Table 3.1**

**Opportunities for Funding, Evidence Required for Funding, and Eligible ESSA SEL-Related Activities, by ESSA Title**

Opportunities for Federal Investment in SEL, by Title, in ESSA	Evidence Required for Funding	Examples of Potentially Relevant Activities (Funded by ESSA and Relevant to SEL)
Title I, Part A: Improving Basic Programs Operated by the Local Education Agencies	Tiers I, II, III, or IV allowable for a subset of Title I activities Tiers I, II, or III only required for at least one intervention in schools identified for comprehensive and targeted support	<ul style="list-style-type: none"> <li>• Schoolwide or Targeted Assistance programs, including academic and nonacademic subject interventions to support the progress of students toward meeting challenging standards</li> <li>• School support and improvement activities focused on improving student outcomes in low-performing schools; can be used for SEL interventions if justified by a needs assessment</li> </ul>
Title II	Tiers I, II, III, or IV Most allowable uses of funds must be evidence-based to the extent that the state finds that such evidence is reasonably available	<ul style="list-style-type: none"> <li>• Professional development for teachers and school leaders, including for the provision of explicit SEL instruction and for integration of SEL into academic instruction</li> </ul>
Title IV	Tiers I, II, III, or IV	<ul style="list-style-type: none"> <li>• Student support and enrichment activities that promote social and emotional outcomes</li> <li>• Expanded learning time that addresses SEL</li> <li>• Efforts to promote safe and healthy schools through the provision of SEL instruction</li> <li>• Implementation of community schools that emphasize students' academic as well as nonacademic needs</li> </ul>



THANK GOD YOU ARE HOME...  
SOMEONE BROKE IN AND ATE YOUR  
ROTISSERIE CHIKEN AGAIN

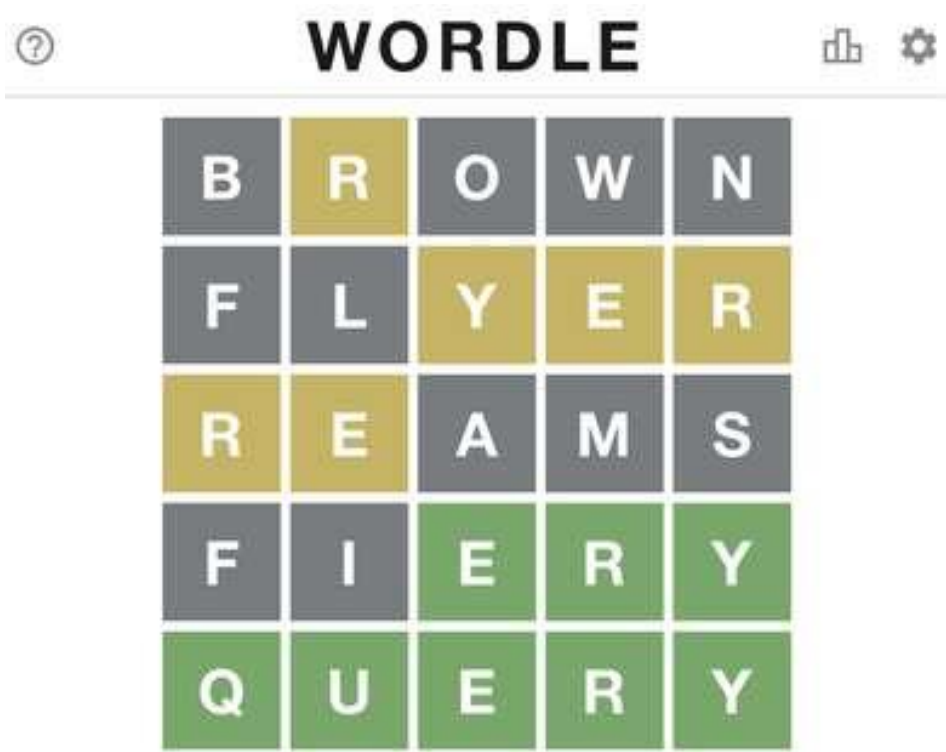


# Lunch

---



**Branch Alliance**  
for Educator Diversity



Guess the **WORDLE** in 6 tries.

After each guess, the color of the tiles will change to show how close your guess was to the word.

**W** E A R Y

The letter **W** is in the word and in the correct spot.

P I **L** O T

The letter **L** is in the word but in the wrong spot.

**V** A G **U** E

The letter **U** is not in the word in any spot.

# Wordle

INSERT WORDLE LINK



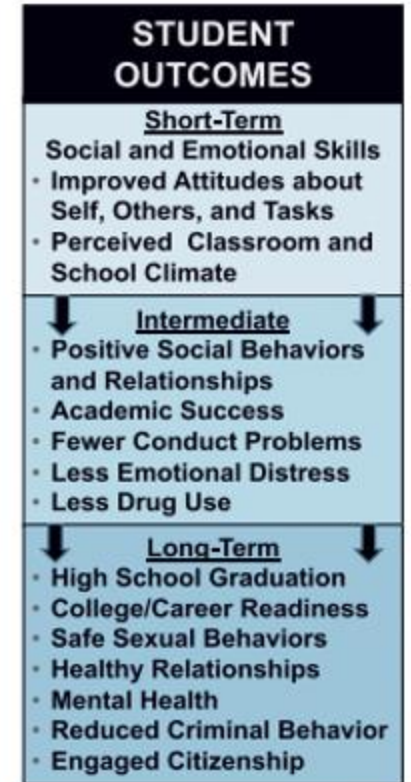
**Branch Alliance**  
for Educator Diversity

## WHAT AND WHERE?

## HOW?



## WHY?



**Branch Alliance**  
for Educator Diversity



**Branch Alliance**  
for Educator Diversity

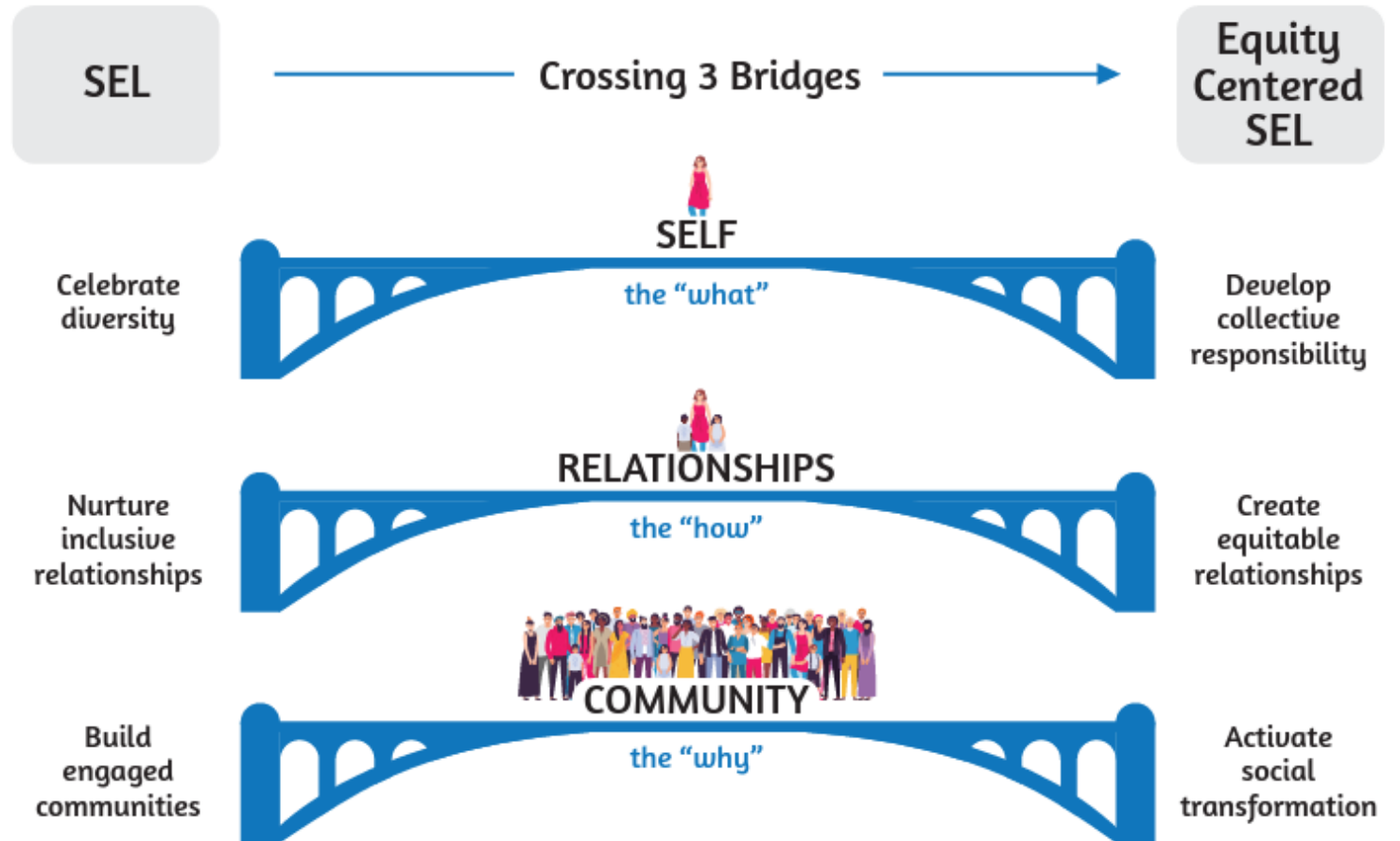


Transformative SEL is aimed at educational equity—fostering more equitable learning environments and producing equitable outcomes for children and young people furthest from opportunity.

(Jagers, 2019)

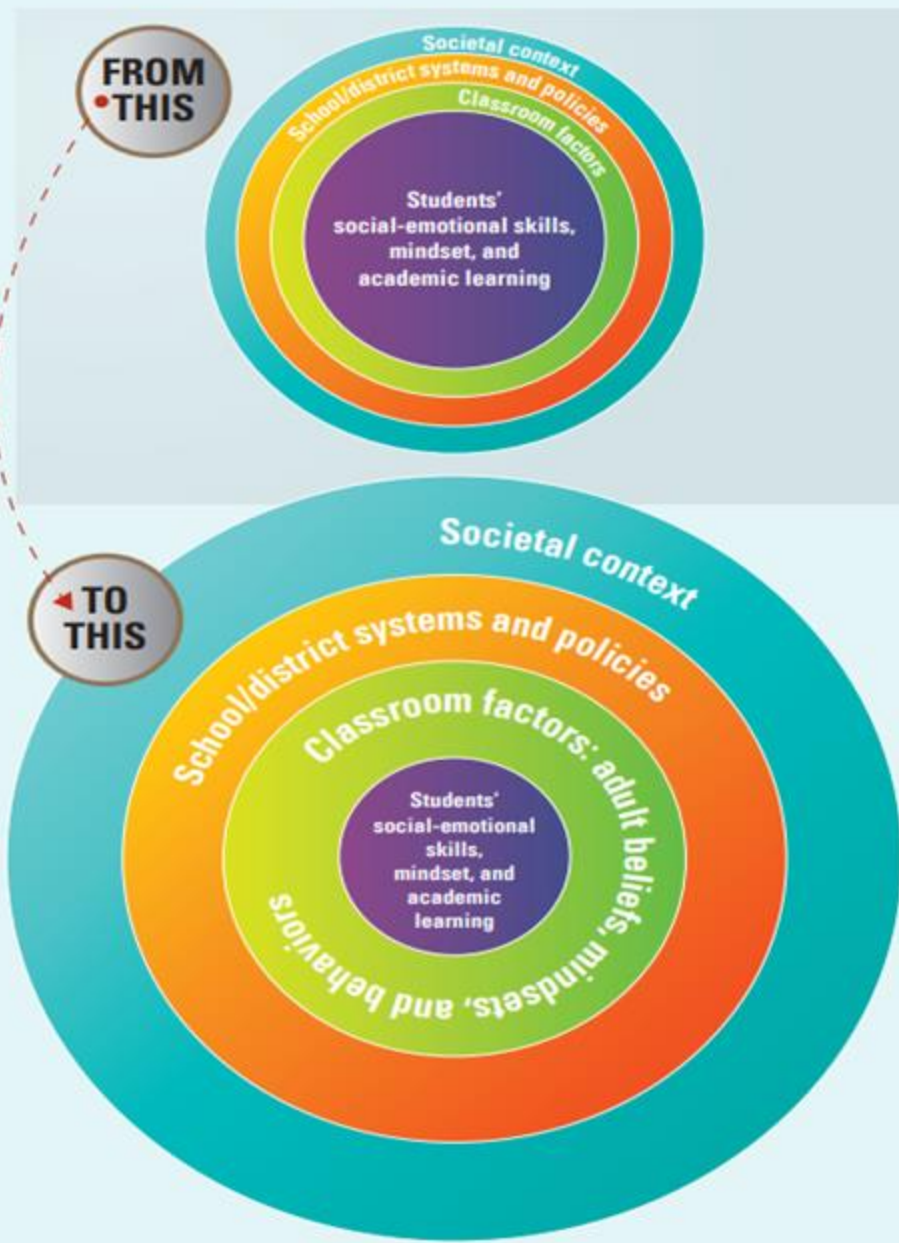


# Teaching with the **HEART** in Mind





## SHIFTING THE FOCUS



**HP** - Health and PE  
**ELA** - Language Arts  
**MTH** - Mathematics  
**SS** - Social Studies  
**CASEL** - CASEL Framework

LESSON TYPE

SEL

GRADES

Grade 4

DOMAINS

☐ All Domains  
☒ Awareness of Self & Others

Lessons

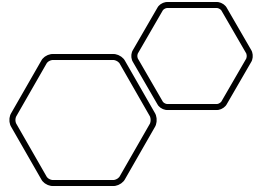
My Playlist

PROGRAM NAME	TIER LEVEL	GRADE	ACTIONS
SEL			
What's Your Superpower? <b>ELA</b> <b>CASEL</b>	Tiers 1 and 2	Grade 4	...
Emotions: Action! <b>ELA</b> <b>CASEL</b>	Tiers 1 and 2	Grade 4	...
My Values, My Choices <b>ELA</b> <b>CASEL</b>	Tiers 1 and 2	Grade 4	...
Where We Belong <b>ELA</b> <b>CASEL</b>	Tiers 1 and 2	Grade 4	...
Remember This! <b>ELA</b> <b>CASEL</b>	Tiers 1 and 2	Grade 4	...

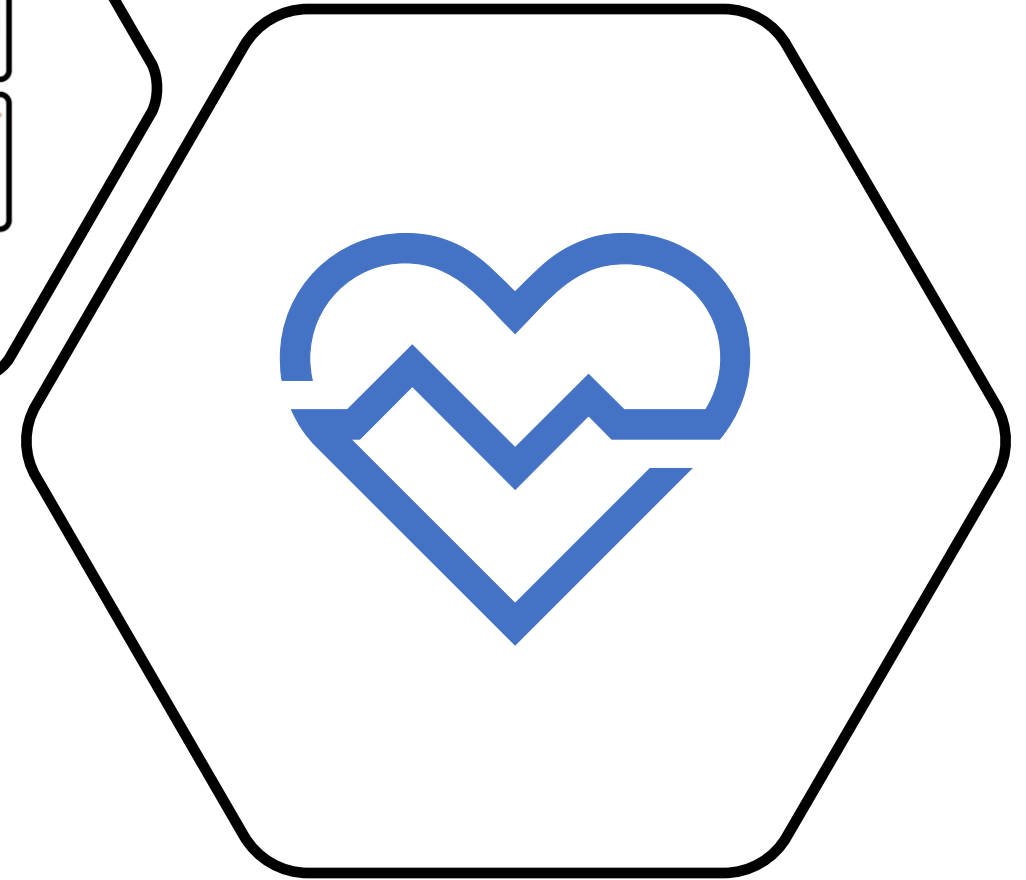
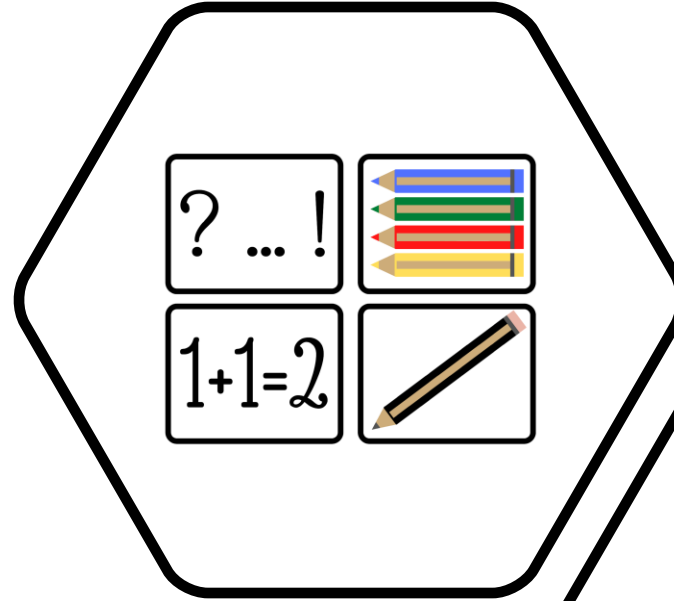
Current Issues, Trends & Practices:  
PK-12 Schools/District



**Branch Alliance**  
for Educator Diversity



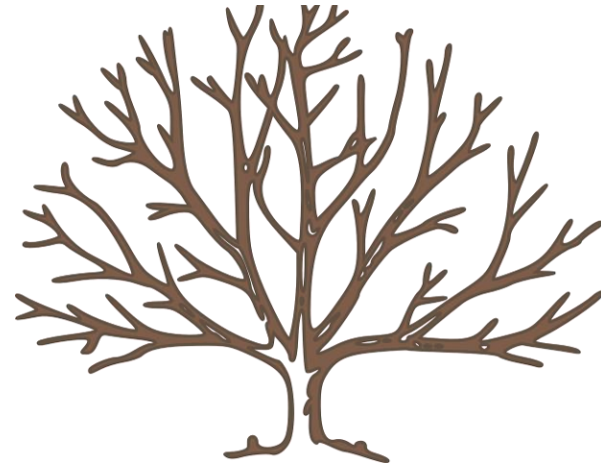
## Current Issues, Trend & Practices: K-12 Schools/District



- SEL as a part of mathematics instruction, not as a separate activity.
- Creating environments that foster healthy social, emotional, and intellectual development.
- My personal emotional, social, and intellectual wellbeing.



**Branch Alliance**  
for Educator Diversity



**Branch Alliance**  
for Educator Diversity

# Break

---

Back in 15 minutes





# Discussion

What are some challenges you feel you may face in implementing SEL at the course/program levels?



# Problem Solving: Busting Through Challenges

A large, stylized comic book sound effect graphic. The word "KAPOW!" is written in bold, red, block letters with a thick black outline. It is set against a bright yellow starburst background, which is further enclosed by a jagged blue border.A comic book sound effect graphic. The word "BAM!" is written in bold, blue, block letters with a thick black outline. It is set against a bright yellow starburst background, which is further enclosed by a jagged red border. Several smaller yellow starbursts are scattered around the main graphic.A comic book sound effect graphic. The word "BOOM!" is written in bold, red, block letters with a thick black outline. It is set against a bright yellow starburst background, which is further enclosed by a jagged red border. Several white smoke clouds are scattered around the main graphic.

**Branch Alliance**  
for Educator Diversity





# Problem Solving: Busting Through Challenges

Select 2-3 challenges  
from our discussion

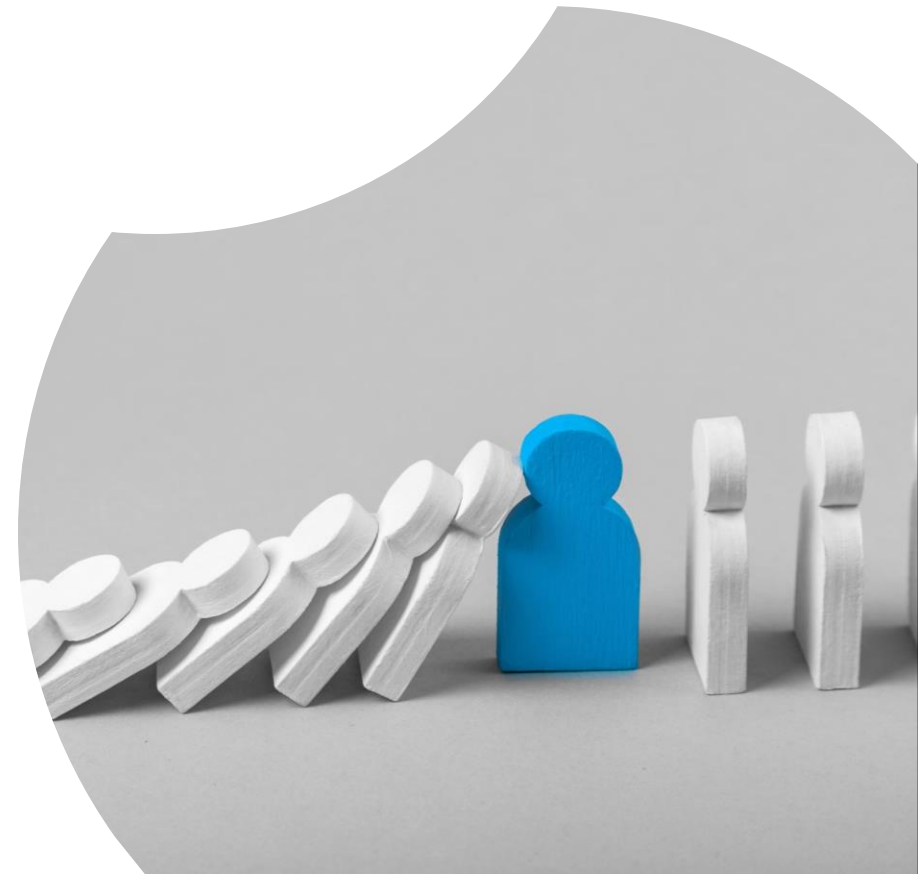
Collaboratively  
develop a quick  
action for dismantling  
the challenges

# EPP Challenges

1. Ensuring sufficient exposure and intensity.
2. Prioritizing and integrating SEL in daily practices
3. Extending SEL beyond classrooms.
4. Ensuring sufficient staff support and training.
5. Facilitating program ownership and buy-in.
6. Using data to inform decision making.
7. Applying and transferring skills.



**Branch Alliance**  
for Educator Diversity



# Personal Reflection: Challenges

1

Educators lack prior knowledge and experience

2

Educators may not practice SEL individually/personally

3

Most SEL strategies are developed for face-to face instruction

4

SEL skills develop over time

5

Most SEL is teacher-led

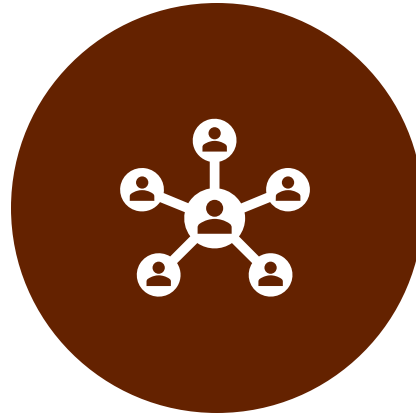


**Branch Alliance**  
for Educator Diversity

# Necessary Connections for Educator Preparation



CONTENT KNOWLEDGE



FIELD EXPERIENCE




PROGRAM IMPACT



**Branch Alliance**  
for Educator Diversity



A pair of hands is gently holding a small, colorful globe of the Earth. The globe is positioned in the center-left of the frame, showing the Arctic region with green landmasses and blue oceans. Labels on the globe include "OCEAN", "Beaufort Sea", "UNITED STATES", "CANADA", and "RUSSIA". The hands are light-skinned and are holding the globe from the sides. The background is a warm, out-of-focus brown. On the right side of the image, there is a large, light gray circular overlay containing text.

# Real-World Problem Solving

---

Real Issues



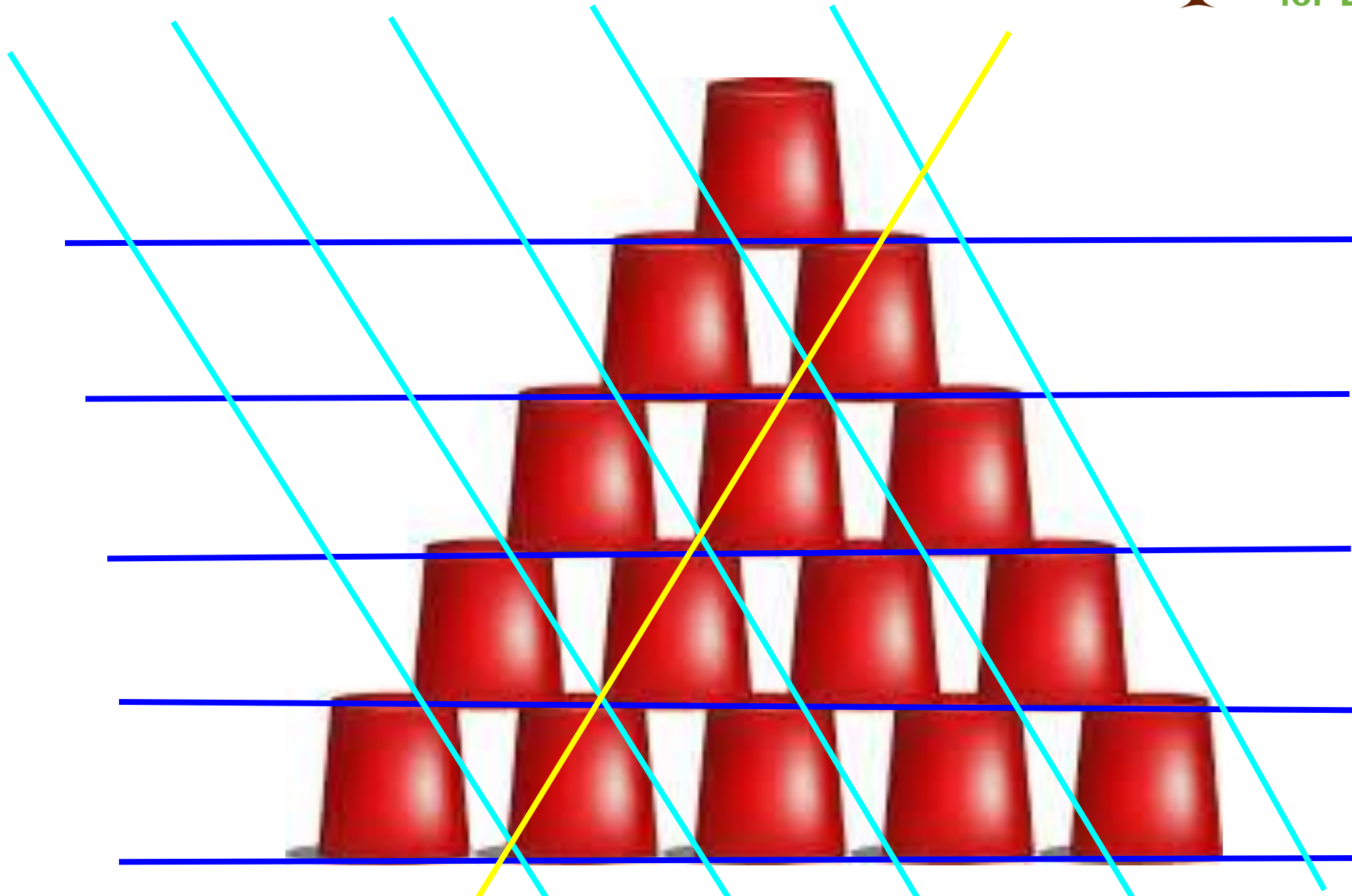
**Branch Alliance**  
for Educator Diversity

Where do you see the Math?



**Branch Alliance**  
for Educator Diversity

# Where Do You See the Math?





# Which Angle will Provide the Sturdier Tower?

---

- Build your cup tower
- Draw a representation of the parallel lines and at least two of the transversals from the cup tower.
- Measure/record the angles and compare.
- Build your cup tower again but separate cups or move cups closer to change the slant on the transversal angles.
- Draw a representation of the parallel lines and at least two of the transversals from the second tower.
- Which tower is the sturdiest?

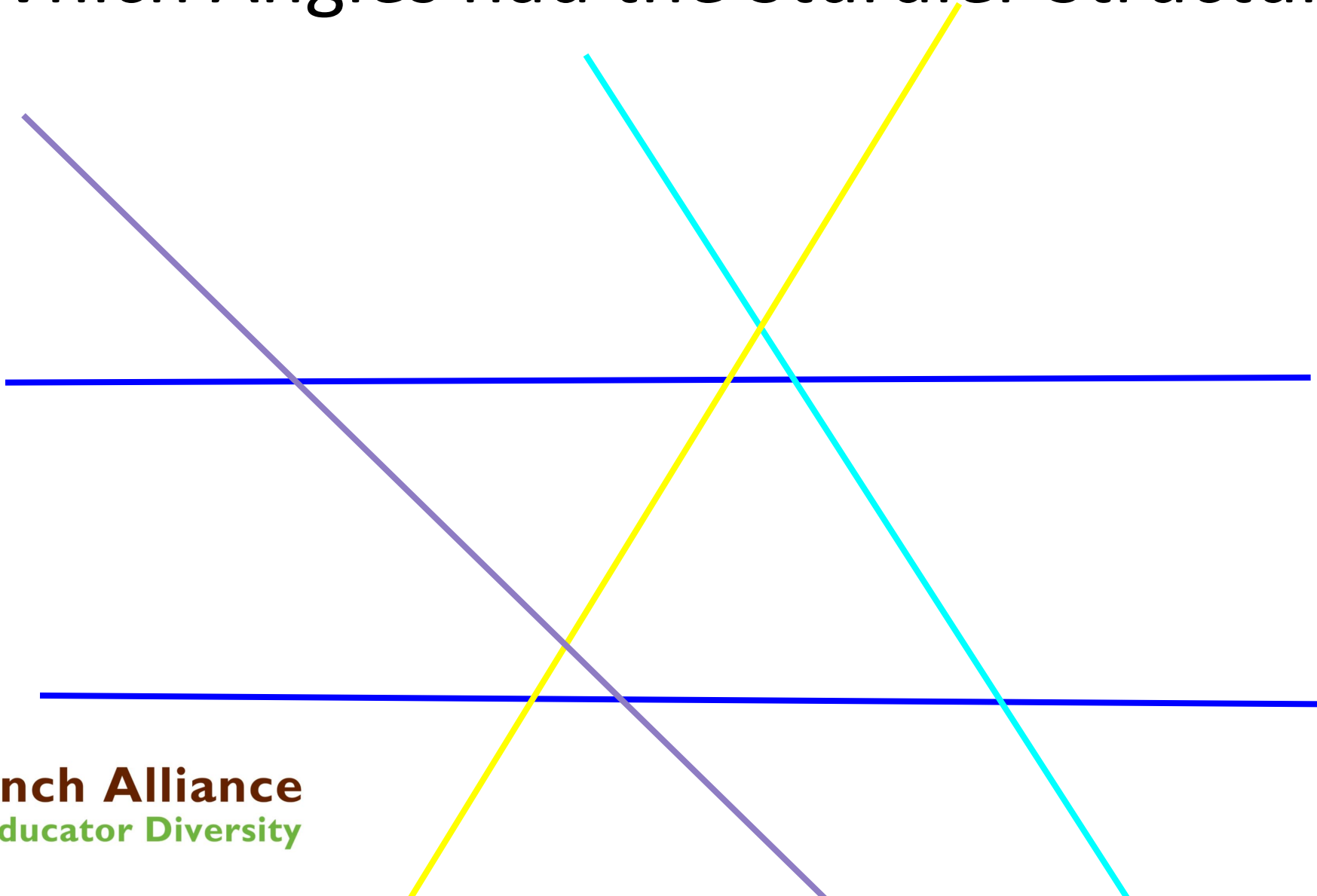


**Branch Alliance**  
for Educator Diversity





# Which Angles had the Sturdier Structure?



How does an experience like this support SEL, Math Identity, Equity, Access, and Inclusion?



**Branch Alliance**  
for Educator Diversity

Equity

**INDIVIDUALIZED + SUPPORT + LEVELING**

Access

**KNOWLEDGE + EXPOSURE + ABILITY**

Inclusion

**REPRESENTATION + APPRECIATION  
+ RESPECT**

Grade	
Students	
Students' Stories	
Question of inquiry	
Standards	
Content Objectives	
You do	
We do	
Higher order thinking questions	
I do while we clarify	
Inclusive Differentiation through heterogeneous small groups	
Groups	Target as necessary
We reflect	
Summarize and Solidify	

Grade		
Learning Objectives		
Essential Questions		
Standards		
Model: (I do)		
(We do)		
Higher order thinking questions		
You Do (Differentiation Activities)		
Above Enrichment	On	Below
Assessment		
Close		
Discuss Essential Question:		

Lesson Planning

A New Approach to Consider

# In Mathematics We Do It With SSAASS

Clark, 2020

## Does your mathematics instruction have SSAASS?

Instructional Components	Description	Considerations for Planning
<b>SET</b> THE STAGE – learning expectations	Establish the expectations of the lesson, the key behaviors and the dispositions/ practices that students will develop through this lesson (think <b>Habits of Mind and Math Practices</b> )	What are the dispositions that students will experience? How will students engage in the required mathematics? Which content standards will be used to build the dispositions/ practices? What tools can students use to maintain or master the disposition/ practice? What social issues are students passionate about? How can they be used to bring relevance (humanity to the mathematics)?
Light a <b>SPARK</b> – igniting the senses	An opportunity for students to engage in or examine the concepts through an activity. Create conflict. It can be a task, contextual problem, intriguing problem, puzzle, etc. The activity relates new content to known content and allows students to use reasoning, logic, sense making to engage in the disposition/ practices while navigating through the activity	What personal experiences will students be engaged in that will introduce the content standard while allowing students to develop the disposition/practice?
<b>ACCENTUATE</b> NEW CONTENT or	Refine structures, <b>create</b> formulas, elaborate on specific processes, define or clarify terms, test reasonableness of methods, document findings.	What questions will students be asked to help them formalize the concepts? What will mastery look like? How will struggle look? How will students be guided to represent their thinking and



# In Mathematics We Do It With SSAASS

Clark, 2020

<b>SKILL - moments of enlightenment)</b>		document their progress? What past content skills can be leveraged? What are possible misconceptions and how will students be led to recognize the inconsistency in the misconception? What terms will have to be explicitly defined and which can be addressed during reasoning? What visuals can be used to build understanding of the concept?
<b>APPLY AND PRACTICE – critically thinking</b>	Practice the new skill/concept. Formalize the math. Determine an appropriate structure. Develop deeper and broader understanding of the major concepts, formulas, and terms. Connect new findings to previous understanding or to the real world. Refine skills and build fluency.	What types of practice will support student development of the concepts, content skills, and dispositions? What possible models can be used to address the problems posed? How will student samples be shared? What types of samples will be shared? What will proficiency look like? What will progressing look like? What will mastery look like? What will it look like if students are completely lost?
<b>SOLIDIFY UNDERSTANDINGS – mental synthesis</b>	Confirm students' knowledge and understanding of the content and the ability to apply mathematical practices and habits of mind. Clarify misconceptions and stabilize past knowledge with current knowledge in preparation for adding new knowledge	What are the learning outcomes? How are students expected to display the learning outcomes? What are possible misconceptions? What are others ways to explain or elaborate on the concept? How might students interpret the concept? What questions can I ask to determine students' understanding of the concept?
<b>SUMMARIZE or SHOWCASE FINDINGS – reflecting and advocating</b>	Synthesize, explain, and expound on new skills.  Reflect or review the learning process. Evaluate the interaction with the disposition/ practice	What questions can be asked to guide meta-cognition? What tools can be used to capture reflective thinking? How will students interact with each other and the whole group? What type of summary format will be used? Who should be included in the audience?  What platforms should be provided for students? How can this become an opportunity for students? What can be done to make this a meaningful experience?

# How to create Real-World Problem Solving Activities

## Shelter in Place Dates

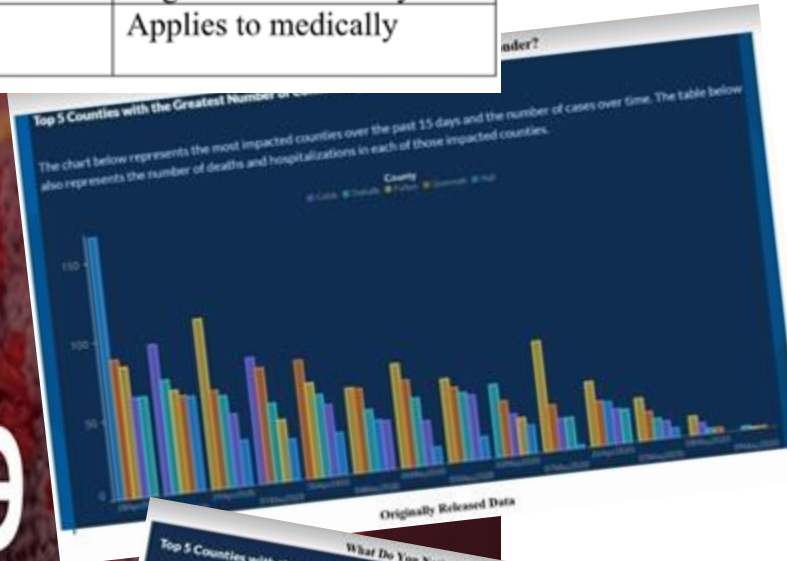
Start Date	End Date	Comments
April 2, 2020	April 30, 2020	Applies to everyone
April 30, 2020	June 12, 2020	Applies to medically fragile and the elderly
May 28, 2020	July 12, 2020	Applies to medically

Grade	
Students	
Students' Stories	
Question of inquiry	
Standards	
Content Objectives	
You do	
We do	
Higher order thinking questions	
I do while we clarify	
Inclusive Differentiation through heterogeneous small groups	
Groups	Target as necessary
We reflect	
Summarize and Solidify	

# COVID-19

Released Data  
Georgia Covid-19 Data

Date	# Counties Affected	Positive Cases	Fatalities	Fatality By Sex		Hospitalizations
				Male	Female	
March						
3/20/20	50	420	13	-	-	-
3/21/20	55	507	14	-	-	-
3/22/20	59	600	23	11	12	-
3/23/20	67	772	25	12	13	-
3/24/20	85	1,026	32	18	14	-
3/25/20	96	1,247	40	23	17	394
3/26/20	97	1,525	48	25	23	493
3/27/20	100	1,800	54	28	26	597



# Applying What You Have Learned

- Revisit your exemplar assignment
- Revise the assignment to reflect Transformation SEL and Mathematics
- Apply the Dana Center self-assessment
- AHAs: Tree of Knowledge



**Branch Alliance**  
for Educator Diversity

## Academic Social and Emotional Learning (SEL) and Mathematics Curriculum Materials



The purpose of the tool is to determine if your mathematics instructional materials support students' understanding and application of widely accepted social and emotional learning (SEL) competencies. It is important to note that such supports within mathematics instructional materials are not sufficient for comprehensive understanding and applications of SEL competencies. Students also need direct instruction in each of the SEL competencies, and teachers need specific training in the SEL competencies and how to incorporate them into daily instructional practice.

From the Aspen Institute's National Commission on Social, Emotional, and Academic Development research brief, students need:

1. Explicit instruction in understanding and applying social-emotional skills/competencies;
2. Opportunities to practice these skills/competencies embedded into academic instruction; and
3. A learning environment that models safety, respect, and purpose so that students can invest their whole selves in learning.

Guiding questions:

- Do the **instructional materials** promote student engagement in the SEL competencies and the application of the Standards for Mathematical Practice (SMP) in ways that connect to the academic SEL competencies?
- Do the **educator supports** explicitly describe ways to engage students in the SEL competencies and the SMP in ways that connect to the SEL competencies?

	The instructional materials routinely	The educator supports routinely
SELF-AWARENESS	Prompt students to make sense of problems by restating the problem or re-representing the problem. (SMP.1) <input type="checkbox"/> No evidence found   Evidence:	Cue educators to encourage restating or re-representing the problem. (SMP.1) <input type="checkbox"/> No evidence found   Evidence:
	Regularly prompt students to reflect on their thoughts, strengths, and feelings during and/or after learning experiences. (SMP.1, SMP.4) <input type="checkbox"/> No evidence found   Evidence:	Provide teachers with appropriate suggestions for promoting students' self-reflection and self-awareness of thoughts, strengths, and feelings. (SMP.1, SMP.4) <input type="checkbox"/> No evidence found   Evidence:
	Prompt students to relate the mathematics topics to their personal interests or community. (SMP.1) <input type="checkbox"/> No evidence found   Evidence:	Prompt teachers to encourage students to relate the mathematics topics to their personal interests or community. <input type="checkbox"/> No evidence found   Evidence:
	Prompt students to reflect on their personal or academic strengths as a learner or member of the learning community. <input type="checkbox"/> No evidence found   Evidence:	Prompt teachers to encourage students to reflect on the ways in which they are contributing to the learning community. <input type="checkbox"/> No evidence found   Evidence:





# REMEMBER!!

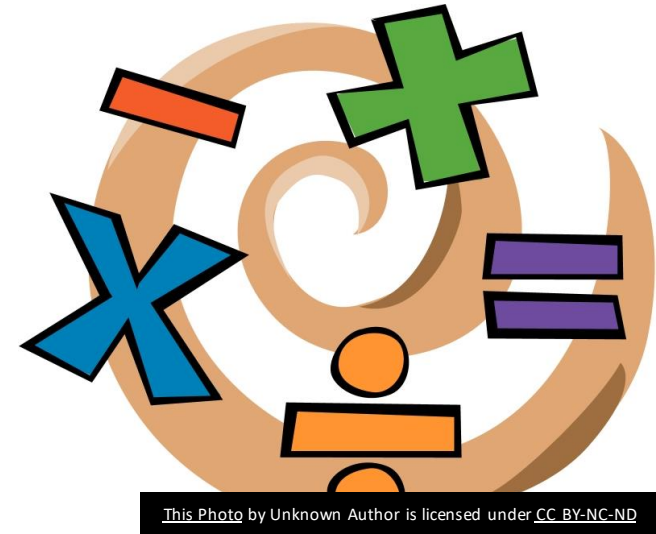
- Group picture at 8:45 AM
- Location: INSERT WHERE THE PICTURE WILL BE TAKEN
- Be ready for your group presentation



**Branch Alliance**  
for Educator Diversity

# A Tale of Two Math Students...

- As a group, you spent some time reflecting on stories of math identity through your eyes or your students' eyes
- Decided on the story that you wanted to tell
- Discussed strategies and encounters with a Math Superhero that could have an impact on the math identity of the character(s) in your story
- Developed a storyboard that told the arc of your character's Math Identity:
  - Who they were.
  - Who they are.
  - Who they could be.
- Tell the Story



**Branch Alliance**  
for Educator Diversity



# Pulse Check

---



**Branch Alliance**  
for Educator Diversity