BranchED Fall 2022 Summit: Day 1

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

Branch Alliance
for Educator Diversity

Welcome

Our Vision

Highly Effective Diverse Educators for all Learners

Branch Alliance for Educator Diversity

Branch Alliance for Educator Diversity (BranchED) strengthens, grows, and amplifies the impact of educator preparation programs at minority serving institutions, with the broader goals of both diversifying the teaching profession and intentionally championing educational equity for all students.

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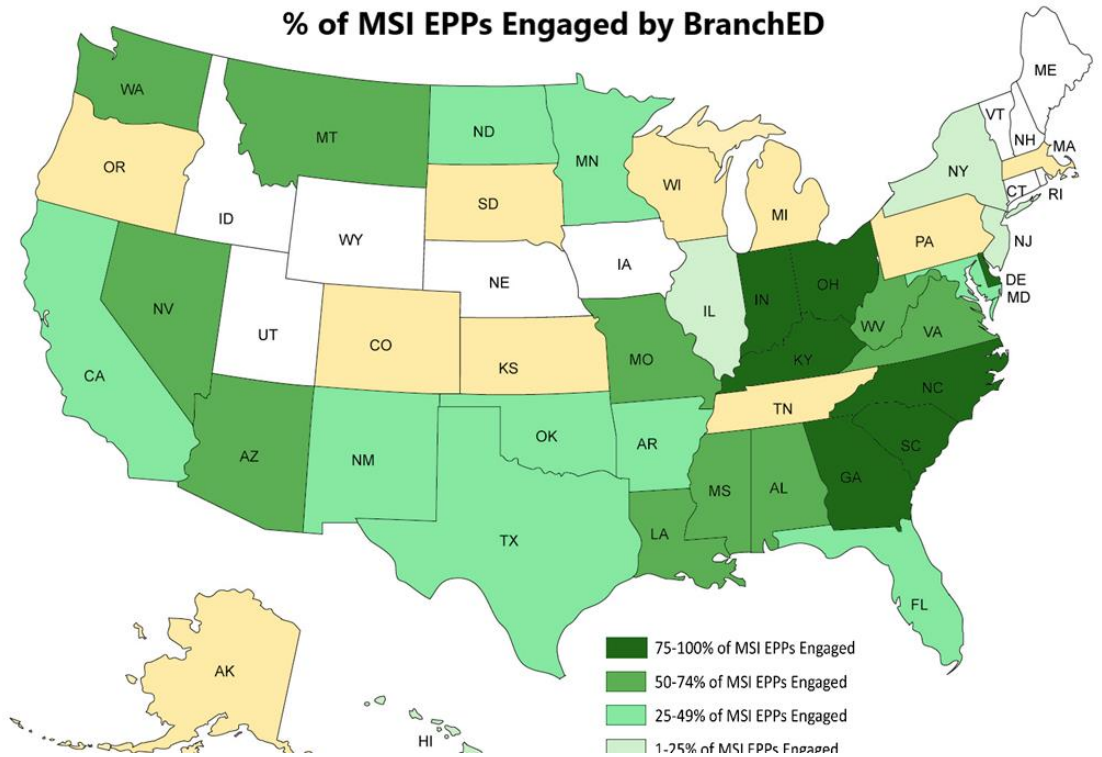
To date, BranchED has engaged 204 educator preparation providers (EPPs) (located across the country in 38 states, the District of Columbia, Puerto Rico, and the Virgin Islands) that prepare some 78,000 teacher candidates per year. And graduate 24,823 teachers per year. These engagements have reached more than 820 faculty and leaders.



HOW WE DO IT

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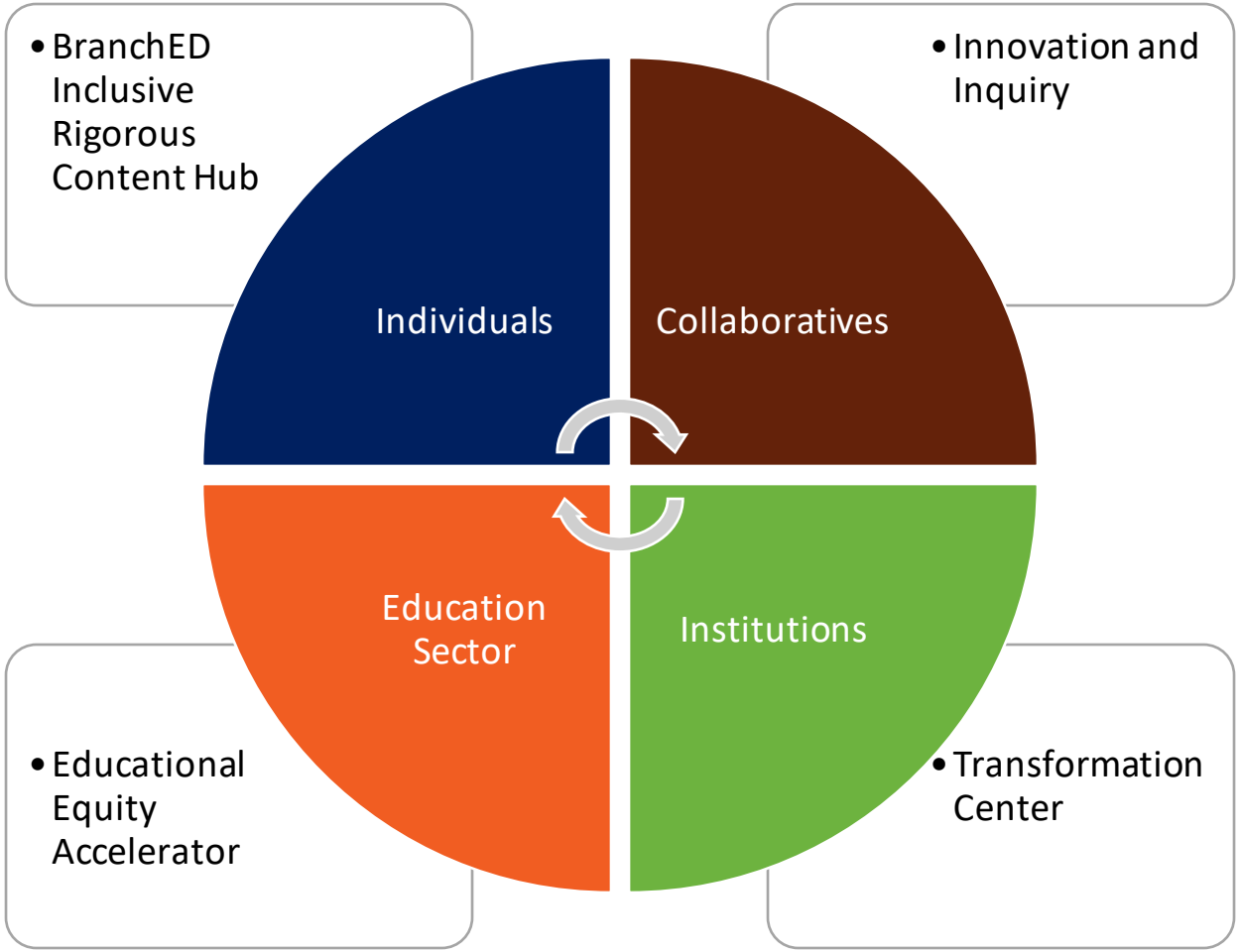

JOHN DEWEY

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REDEFINING QUALITY EDUCATOR PREPARATION

If we teach today's students as we taught yesterday's, we rob them of tomorrow.

Agenda

- Goals and Objectives
- General Housekeeping
- Connector
- The Why
- Critical Self-Reflection
- Math Autobiography
- Our Students

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Goals

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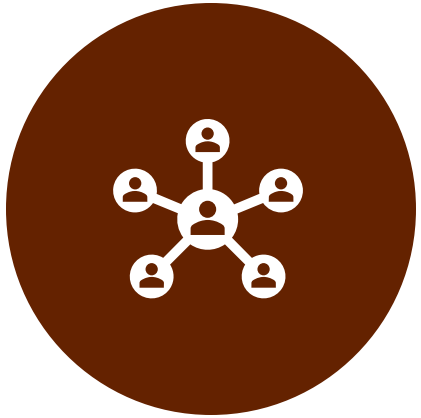
LEARN FROM OUR PEERS



NETWORK

ADD STRATEGIES TO OUR TOOLKIT

Learning Objectives

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1

Introduce the concept of Math Identity and the impact that this identity has on their relationship to mathematics and their mathematical lives

2

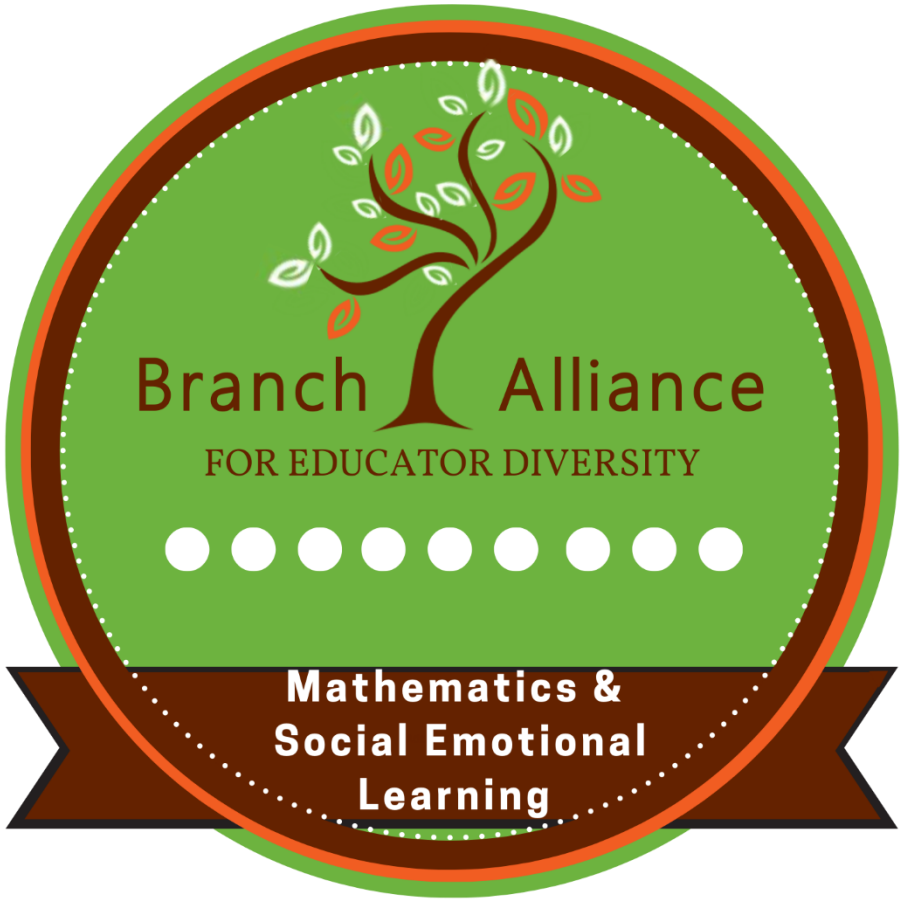
Explore opportunities and influences that will allow pre-service teachers to extend their mathematical content knowledge throughout their teacher education programs

3

Create and implement an action plan that revises or continues your own practices as informed by suggested practices and/or activities.

DIGITAL BADGE

- Indicator of accomplishment that can be shared with your networks
- Aligned to specific competencies
- Requires completion of a deliverable



Share Your Learning

EXTERNALLY

- The Experience
- The Learning
- The Networking
- The Fun

#BranchEDFall2022Summit
#MathAsASuperpower
#BranchEDFramework

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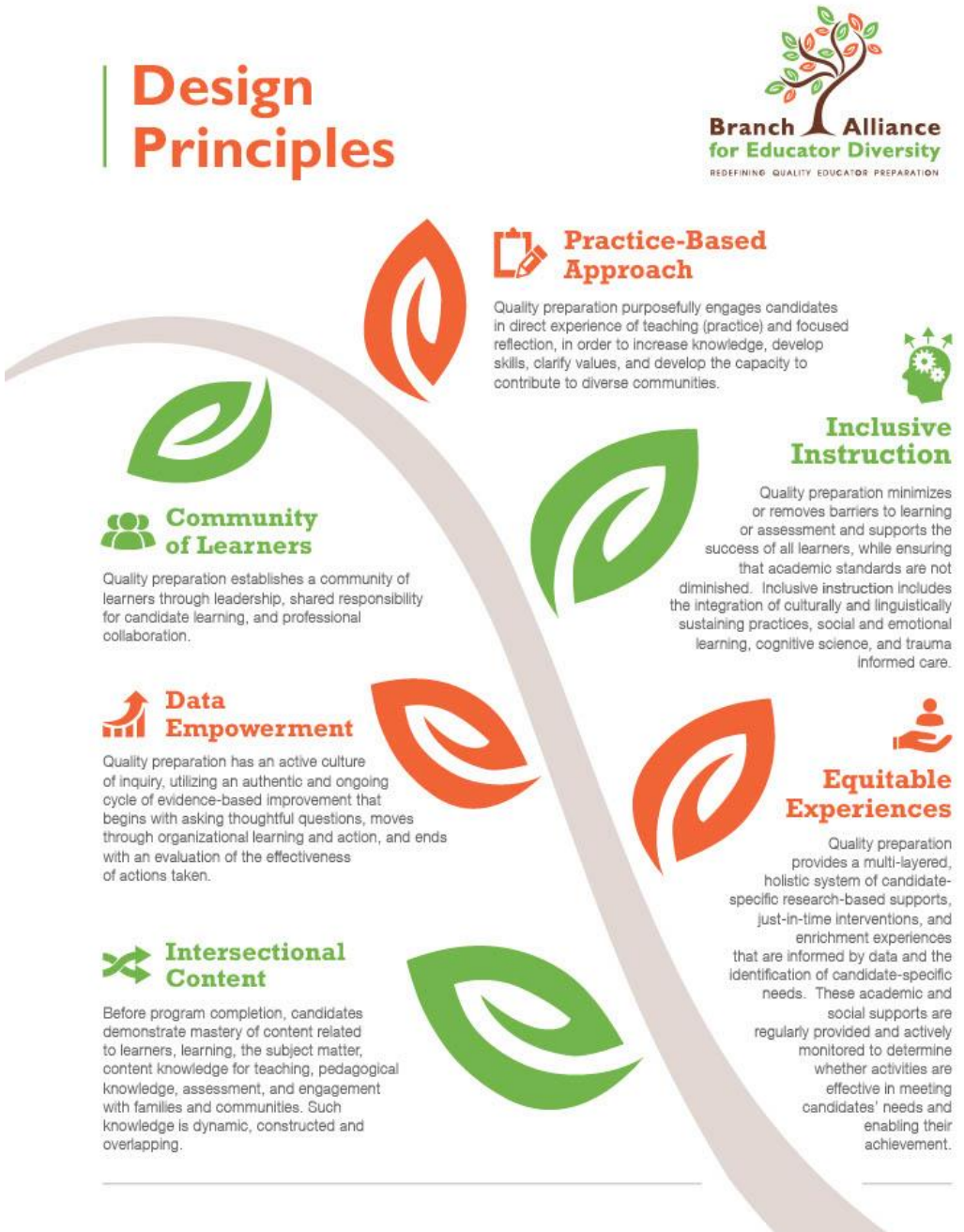
BranchED Framework for Quality Educator Preparation Program

#BranchEDFramework

Practice-Based Approach
Inclusive Instruction
Intersectional Content
Culmination



BRANCHED TREE OF KNOWLEDGE

INTERNALLY

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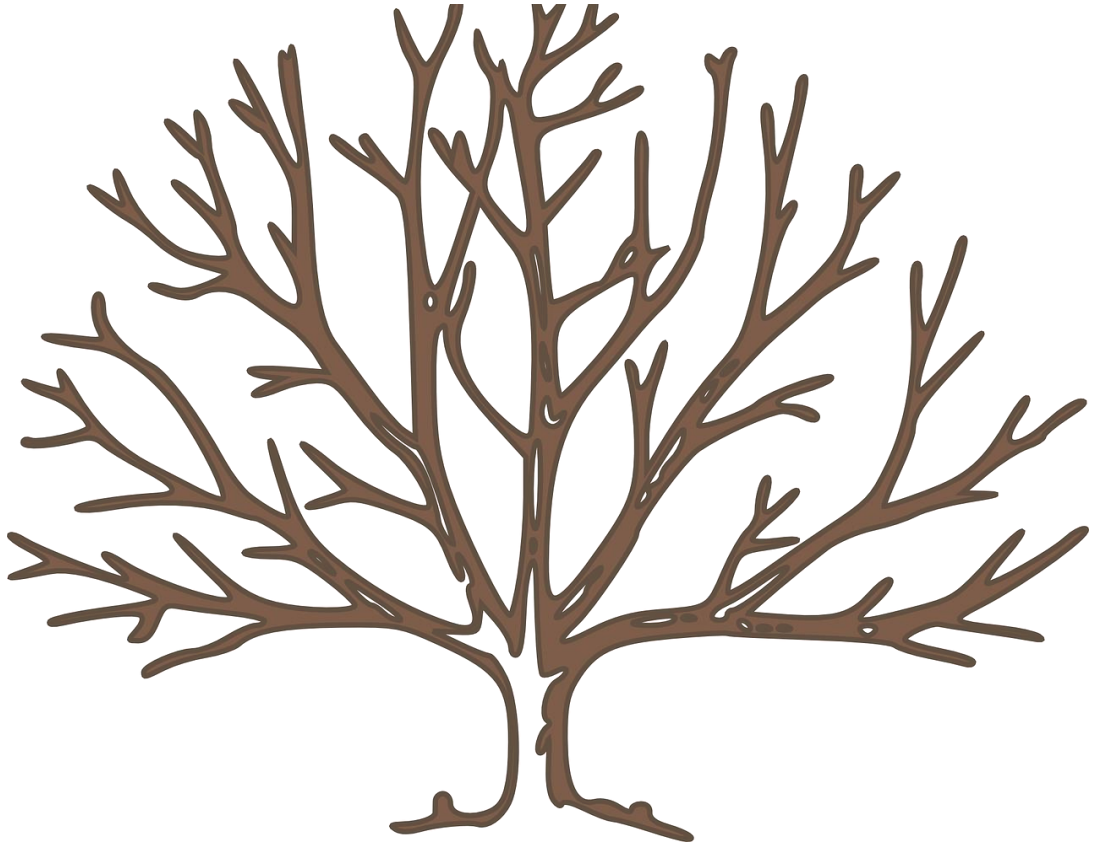

Summit Webpage

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

Norms

- Take an Inquiry Stance
- Assume Positive Intentions
- Take Responsibility for Impact
- Value Multiple Perspectives
- Be Present and Present

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Math Superhero

- Envision your Math Superhero identity
- Use the materials provided to create a superhero cape that illustrates your identity
- Get creative and be ready to share with others
- Wear your cape proudly and remember that YOU are a Math Superhero!

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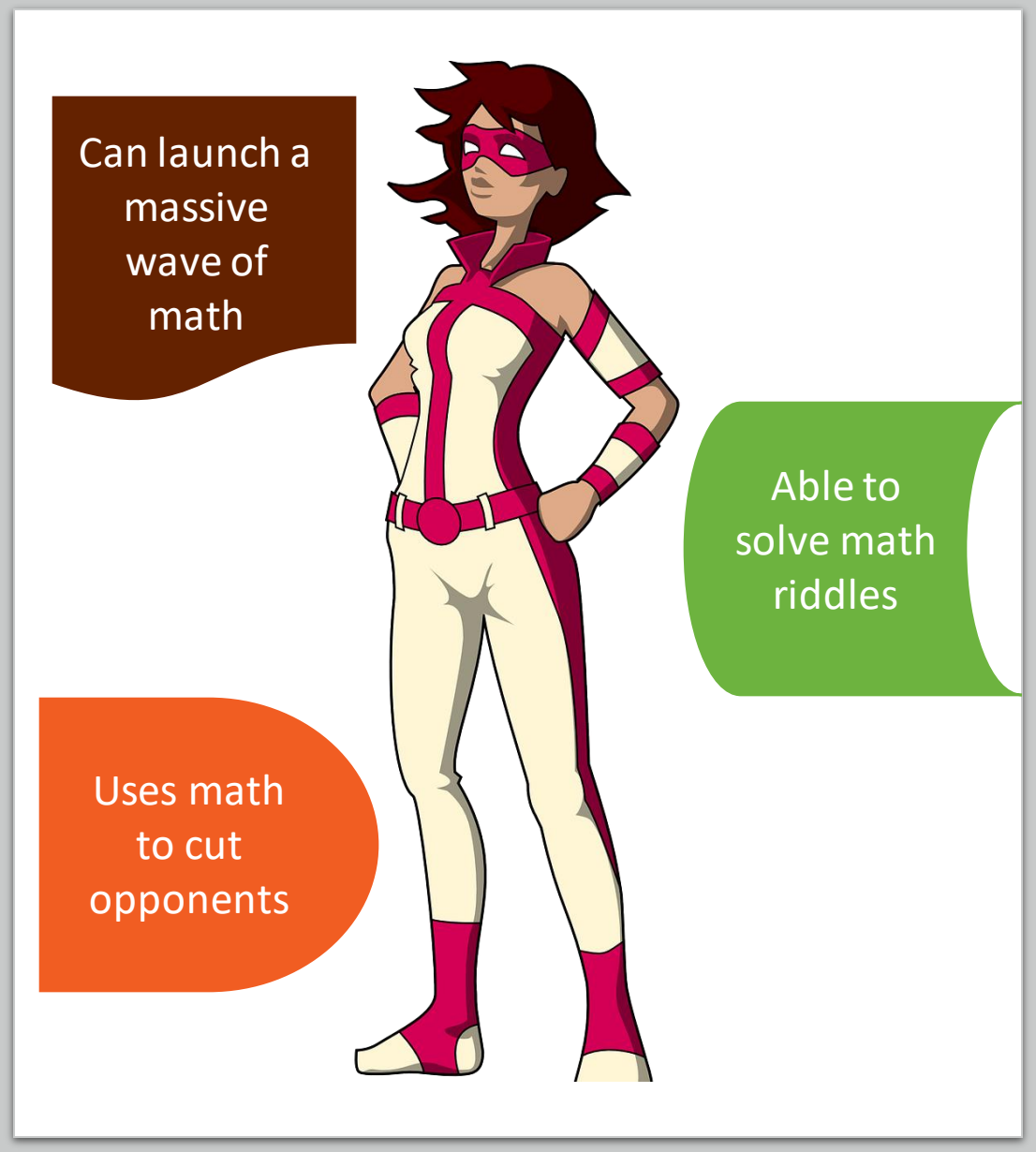
DR. ARITHMECHIC



#Mathasasuperpower

What Is Your Superhero Name?

1. FIRST LETTER OF YOUR NAME

A. Cyber	N. Incredible
B. Dr.	O. Silver
C. Master	P. Awesome
D. Electric	Q. Brilliant
E. Monster	R. Extraordinary
F. Captain	S. Daring
G. Super	T. Invincible
H. Ninja	U. Yellow
I. Solid	V. Saber
J. Agent	W. Robot
K. The	X. Tornado
L. Lightening	Y. Machine
M. Power	Z. Sly

2. YOUR BIRTHDAY MONTH

JANUARY:	Thunderbolt
FEBRUARY:	Blizzard
MARCH:	Rocket
APRIL:	Hurricane
MAY:	Magnetic
JUNE:	Claw
JULY:	Storm
AUGUST:	Ivy
SEPTEMBER:	Fire
OCTOBER:	Phoenix
NOVEMBER:	Wasp
DECEMBER:	Hammer

SUPER SIMPLE

The Why

National Level

The National Landscape

- Math is a **foundational component** of our society and contributes to the development and mastery of **"soft skills"** (e.g., communication, creativity, self-management, and collaboration)
- **6.6 million unfilled positions** due to a significant gap in mathematical skill development in the workforce
- **Mathematical proficiency** is **predictive of** a continuation of the **existing knowledge gap**

(National Science Foundation, 2018; NAEP, 2019; U.S. Department of Labor, Bureau of Labor Statistics, 2020)

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Math Performance

- In **2018 only 42%** of all **fourth-grade** students and **35% of all eighth-grade** students in the US were **proficient in mathematic**.
- The statistics are even **more dire** for the country's **historically underserved student populations**, Black and Latinx students, with only **12% of Black** and **18% of Hispanic** eighth-grade students **demonstrating proficiency**
- Disparities in mathematics achievement are **not just found among racial groups**; severe achievement gaps also exist based on **socioeconomic, English Language Learner (ELL) and disabilities status.**

(National Science Foundation, 2018; NAEP, 2019)

COVID by the Numbers

93% of school-aged children engaged in distance learning

Average school closings 95 instructional days globally

Worldwide 1.8 trillion hours of instructional time lost

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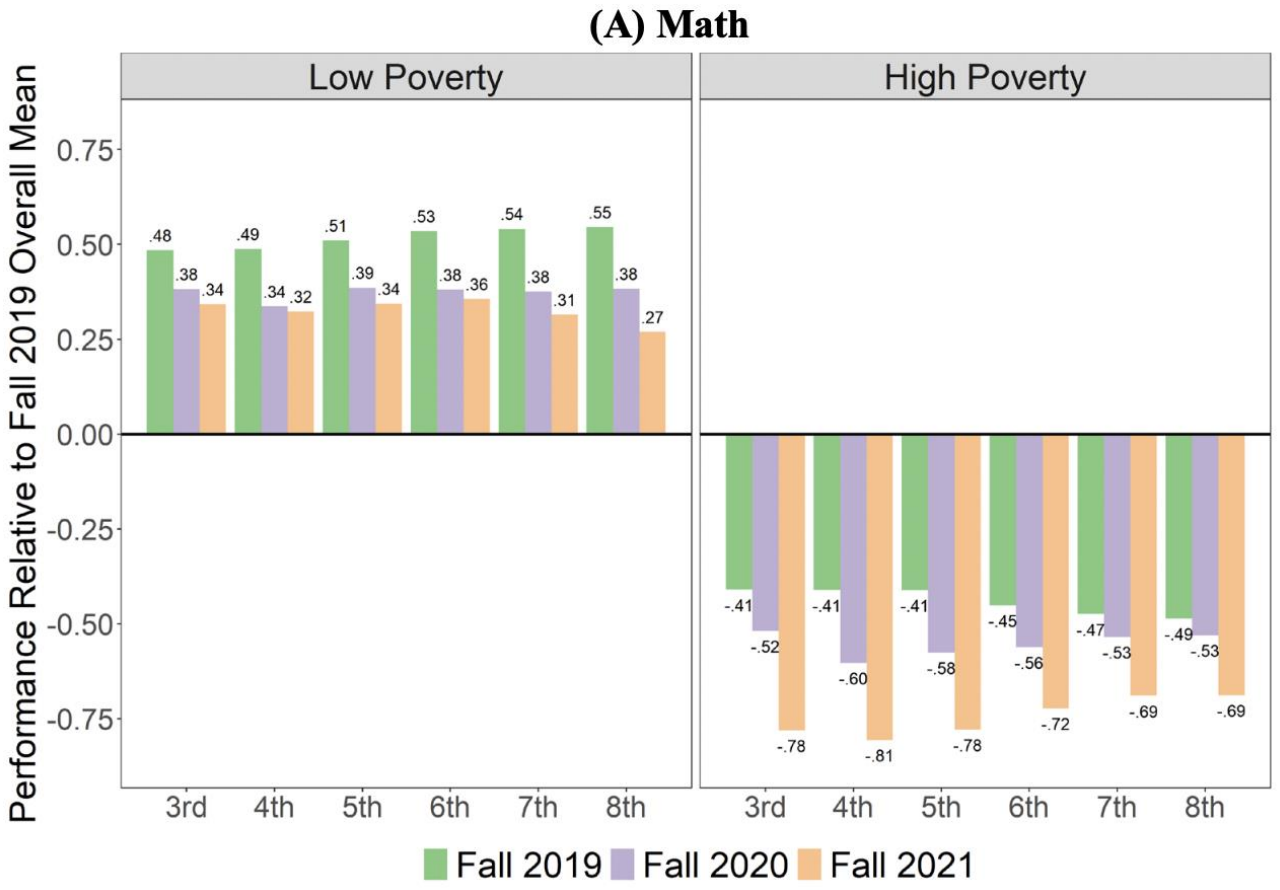
Average fall 2021 math test scores in grades 3-8 were .20-.27 standard deviations (SDs) lower relative to same-grade peers in fall 2019

fall 2019

2020–2021

Achievement gaps between students in low poverty and high-poverty elementary schools grew by .10-.20 SDs, primarily during the 2020-21 school year.



Kuhfeld, M., et al., 2022

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COVID by the Numbers

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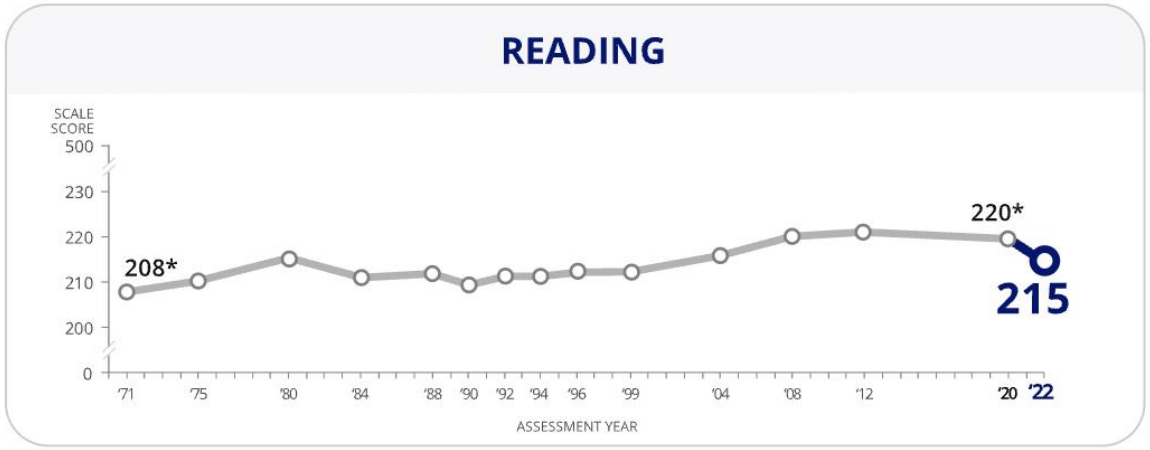
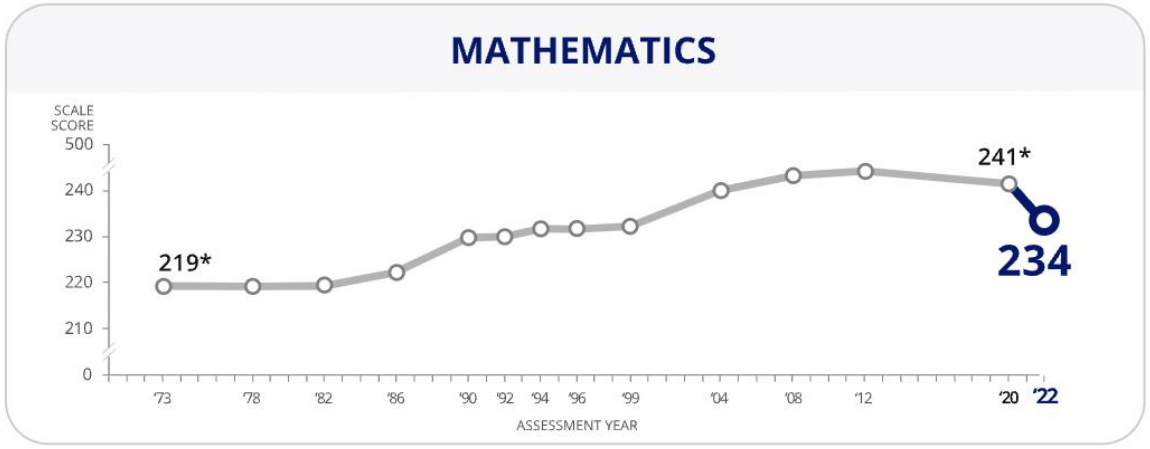




* Significantly different ($p < .05$) from 2022.

Average scores for age 9 students in 2022 declined 5 points in reading and 7 points in mathematics compared to 2020

The largest average score decline in reading since 1990, and the first ever score decline in mathematics.

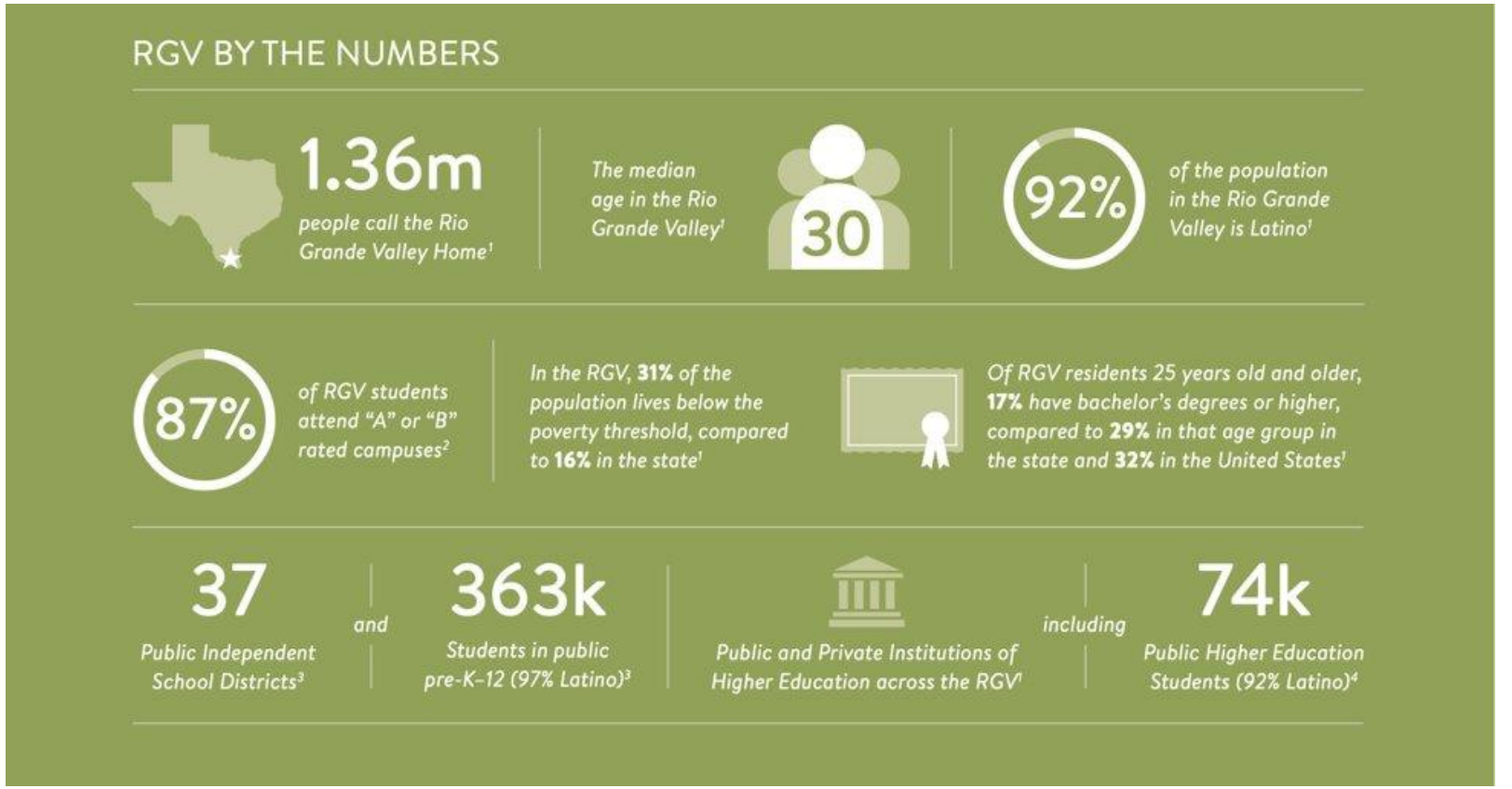
National Center for Education Statistics (2022)

Rio Grande Valley

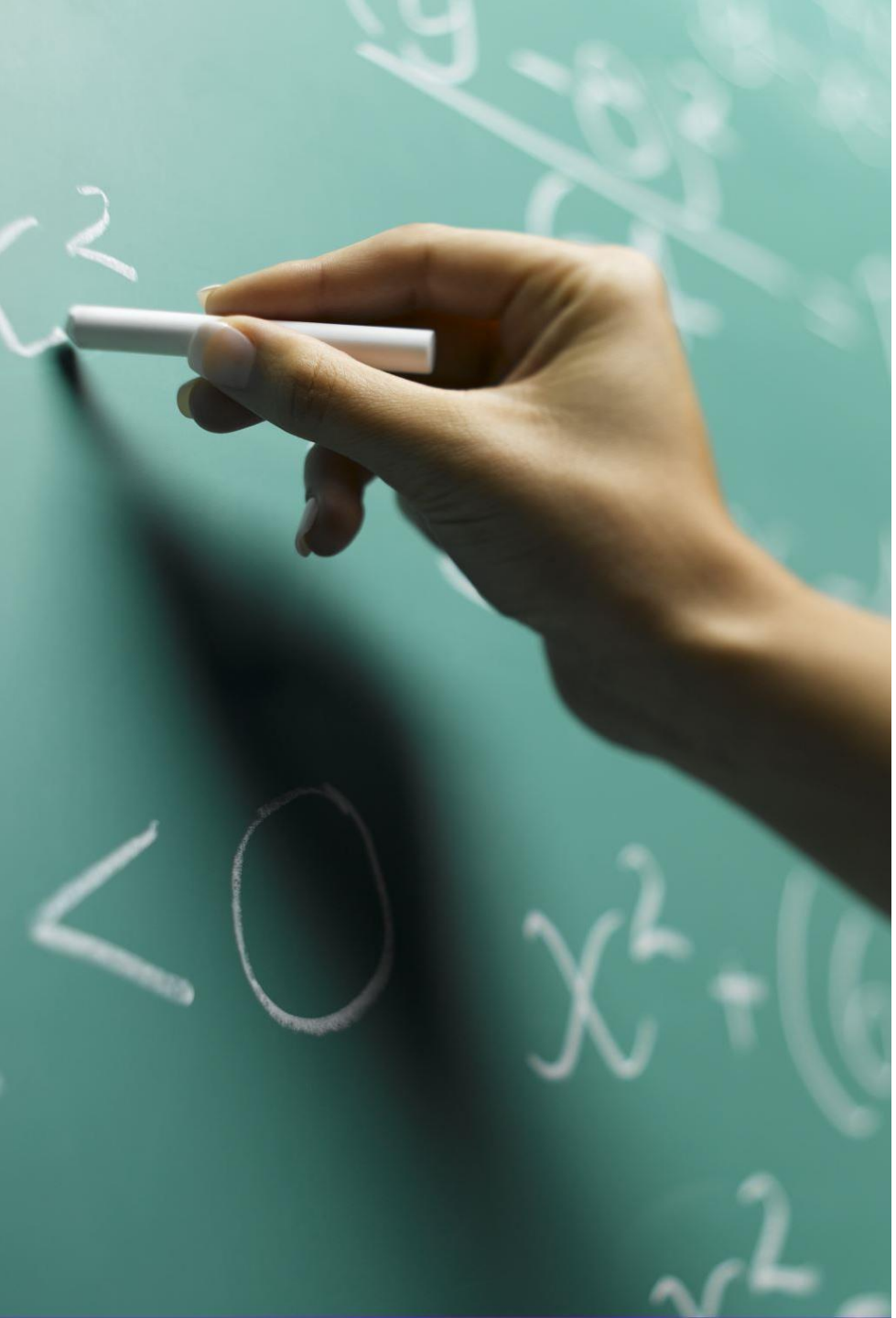
Strategic initiative in South Texas' Rio Grande Valley (RGV) to increase postsecondary readiness and access to help make every student successful in school, in the workforce and in life

RGV Snapshot

high rigor, high expectations, and high support for children and families



Source: RGV FOCUS Annual Report, 2019



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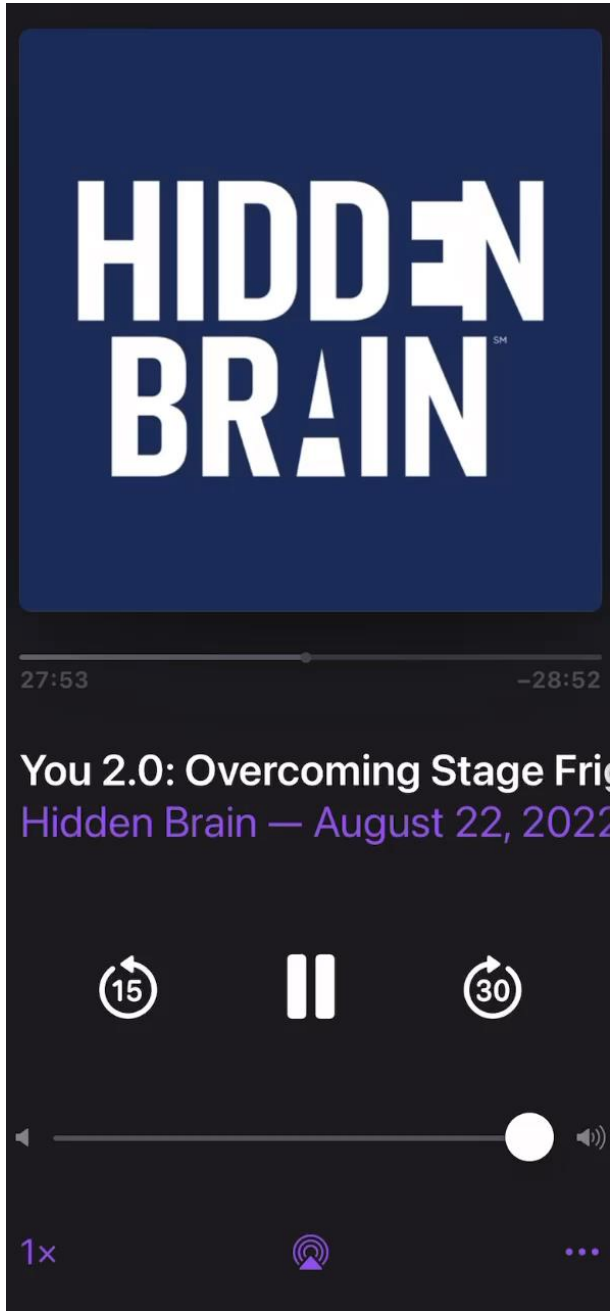
Math Educators

- Studies have shown that **preservice teachers lack of knowledge in mathematics** resulted in their **negative attitudes about math**
- Although **student attitude** may be another factor leading to mathematics anxiety, **the attitudes of teachers** and the **teaching techniques** employed seem to be a **primary cause**.
- Tobias (1978) wrote **that bad experiences with math teachers can foster math anxiety** and Fiore (1999) stated that **"teachers and the teaching of mathematics are known to be the roots of most mathematics anxiety"** (p. 403).

Plaisance, D. V. (2009).

Math Phobia

- Math phobia or math anxiety has been defined as a condition characterized by feelings of panic, helplessness, paralysis, and/or mental disorganization that arises when an individual faces mathematical reasoning or calculation



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Math Identity

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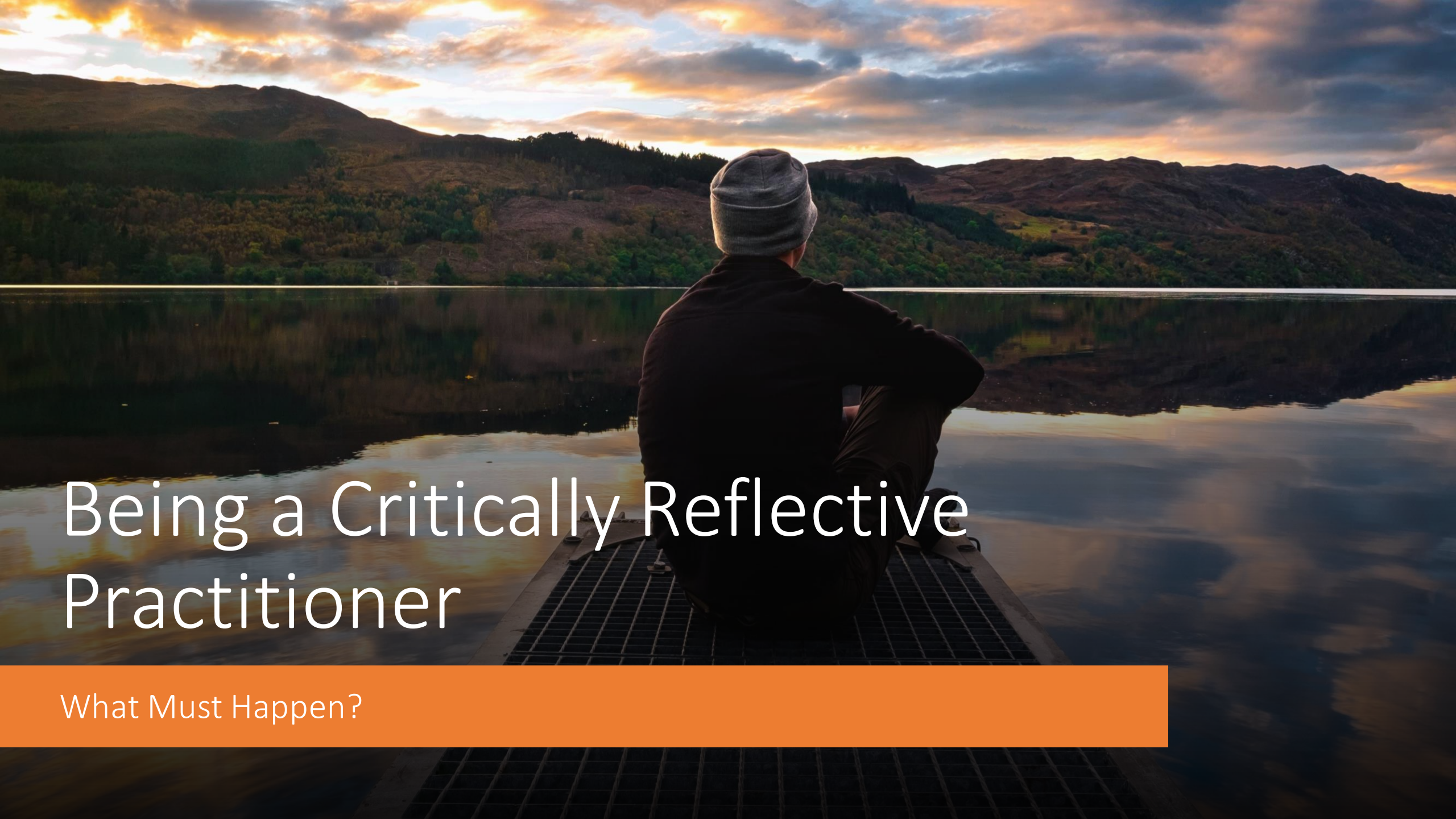
- Identity, broadly, refers to a person's sense of who they are and the development of an identity permits people to make predictions about their abilities to navigate different aspects of their life (cf. [9]).
- Math Identity (math self concept, interest, and value)
  - The degree to which one considers oneself to be a math person

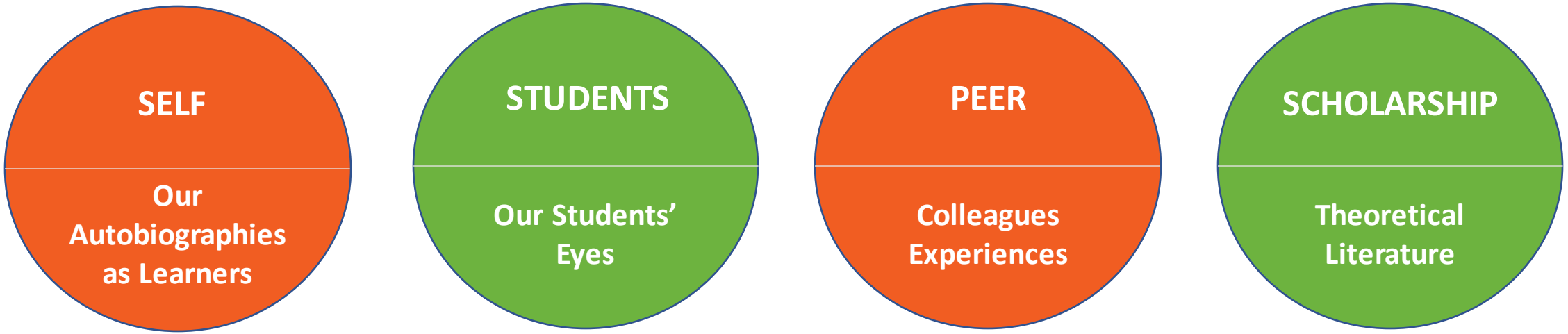
Crossley, et. al., 2018



Being a Critically Reflective Practitioner

What Must Happen?

Critically Reflective Practice



(Brookfield, 1995)

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SELF: Our Autobiographies as Learners

- Knowing what and how to teach is not sufficient to make one's teaching thoughtful.
- Knowing one's self is as important as or even more important than traditional ideas of professional knowledge.
- Professional growth and development should include initiatives that reflect teachers' identities and foster self-questioning and reflection

(Fairbanks et al., 2010; Cole & Knowles, 2000)

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Espoused Theory vs Theory-in-Use

- Our autobiographies speak to our experiences as learners that are likely to have a profound, long-lasting influence on our practice.
- The autobiographical lens is the foundation of critical reflection
  - Focus on previous experiences to become aware of the assumptions and reasonings that frame our work
  - Examine gaps in espoused theories and theories-in-use
  - Reveal areas of pedagogy that may need adjustment or strengthening

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Benefits of Autobiographical Inquiry

- Enables teachers to self-examine
- Raises awareness of teaching philosophies and values that influence teaching practices
- Fosters teachers' self-awareness, knowledge, and identity
- Promotes re-examination of life experiences

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Silent walk

Goal: To explore who we are as math learners and how past experiences have shaped this sense of ourselves.

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- Imagine that a publisher has invited you to write your story as a math learner in three chapters. What would the titles be?
- Is there a metaphor or central theme that runs throughout your story?
- What influenced your journey to become a math educator?
- How has your own math identity changed over the years?
- How did you see or not see equity and social emotional learning centered in your own experiences as a math learner?

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WRITING TIME

SMALL GROUP
LARGE GROUP
SHARE OUT

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Math Through Their Eyes

Your Students

- Reflect on your students' math identity.
- Based on what you know, describe the math journey of your students.
- What commonalities have you observed?
- What experiences stand out in your mind.

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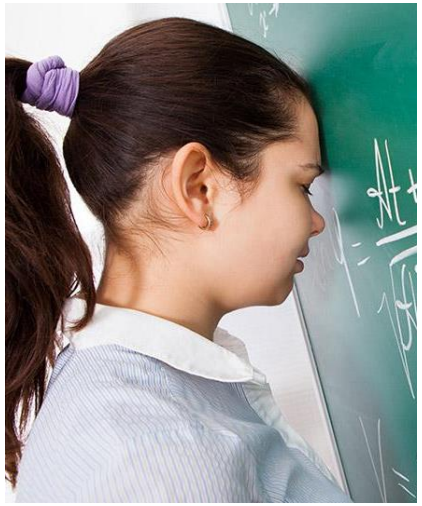

A Tale of Two Math Students…

- As a group, spend some time reflecting on stories of math identity through your eyes or your students' eyes
- Decide on the story that you want to tell – it can be one individual's experience or a combination of multiple stories
- Discuss strategies and encounters with a Math Superhero that could have an impact on the math identity of the character(s) in your story
- Develop a storyboard that tells the arc of your character's Math Identity: Who they were. Who they are. Who they could be.
- Get creative and make plans to share your story on Day 3.

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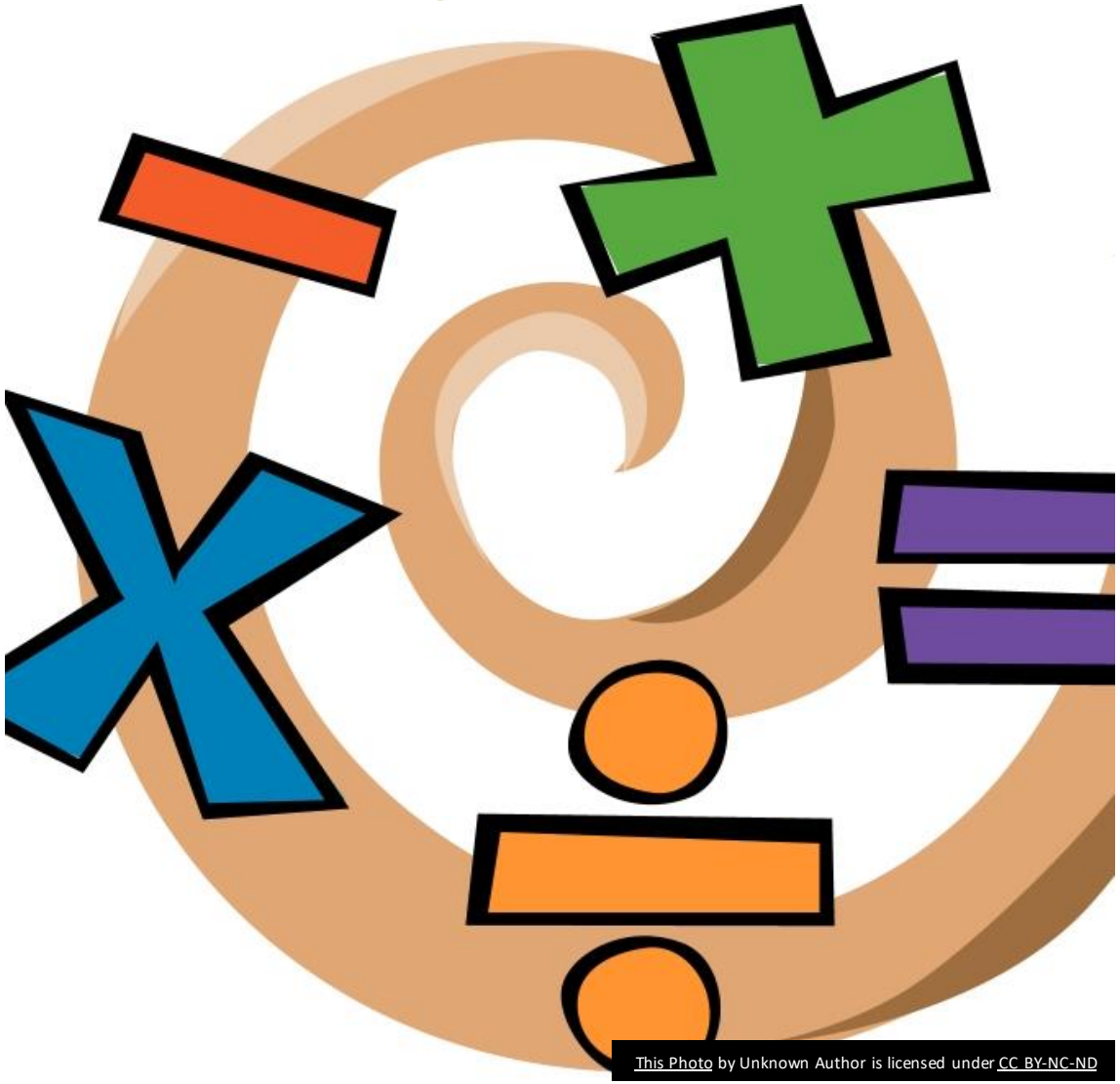

Pulse check

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REDEFINING QUALITY EDUCATOR PREPARATION

Reception and Dinner