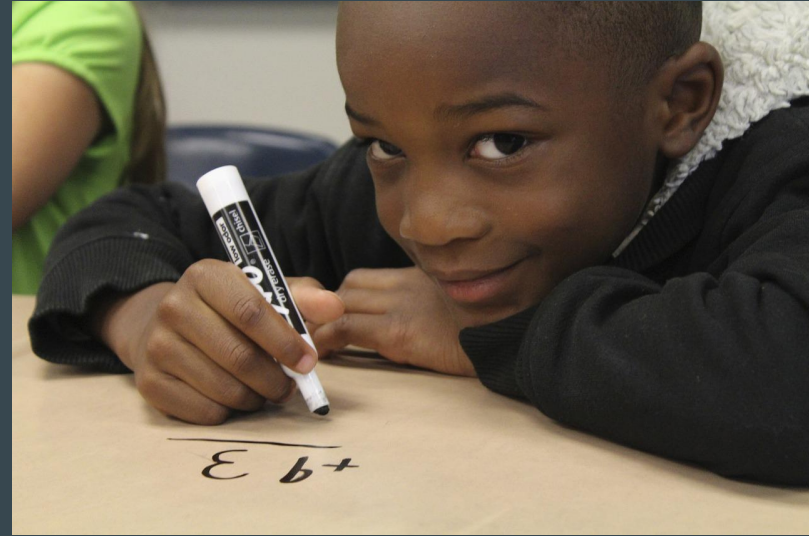


# How the California Framework Supports Access and Equity For All



**Dr. Kyndall Brown**  
**UC Davis Mathematics Project**  
**September 14, 2023**

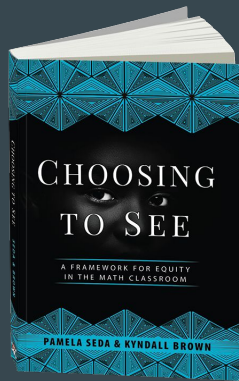
# Agenda

- I. Framework K-W-L
- II. ICUCARE Framework
- III. Chapter 1: Mathematics For All
- IV. Chapter 2: Teaching For Equity and Engagement
- V. Chapter 9: Structuring School Experiences for Equity and Engagement
- VI. Chapter 5: Data Science
- VII. Framework Rollout
- VIII. Q&A

## Framework K-W-L

K	W	L

# ICUCARE Equity Framework



**I**nclude others as experts

Create classroom environments that extend beyond the teacher as the sole authority to develop competence and confidence in others as experts, including the students themselves.

Be **C**ritically Conscious

Take the time to understand how negative stereotypes impact your students and actively work to erase the effects of those negative stereotypes on the educational outcomes of diverse learners.

**U**nderstand your students well

Learn about your students, their families and their communities for the purpose of improving instruction. (Not making assumptions)

Use **C**ulturally relevant curricula

Use instructional materials in ways that help students see themselves as doers of mathematics and help them to overcome the stereotypes and messages regarding who is mathematically smart.

**A**ssess, Activate and build on prior knowledge

Value the prior knowledge that students bring to the classroom, both personal and cultural, and use that knowledge as a resource for creating new knowledge.

**R**elease control

Empower your students to take ownership of their own learning by focusing on sensemaking and allow them to make choices about things that are important to them in the classroom.

**E**xpect more

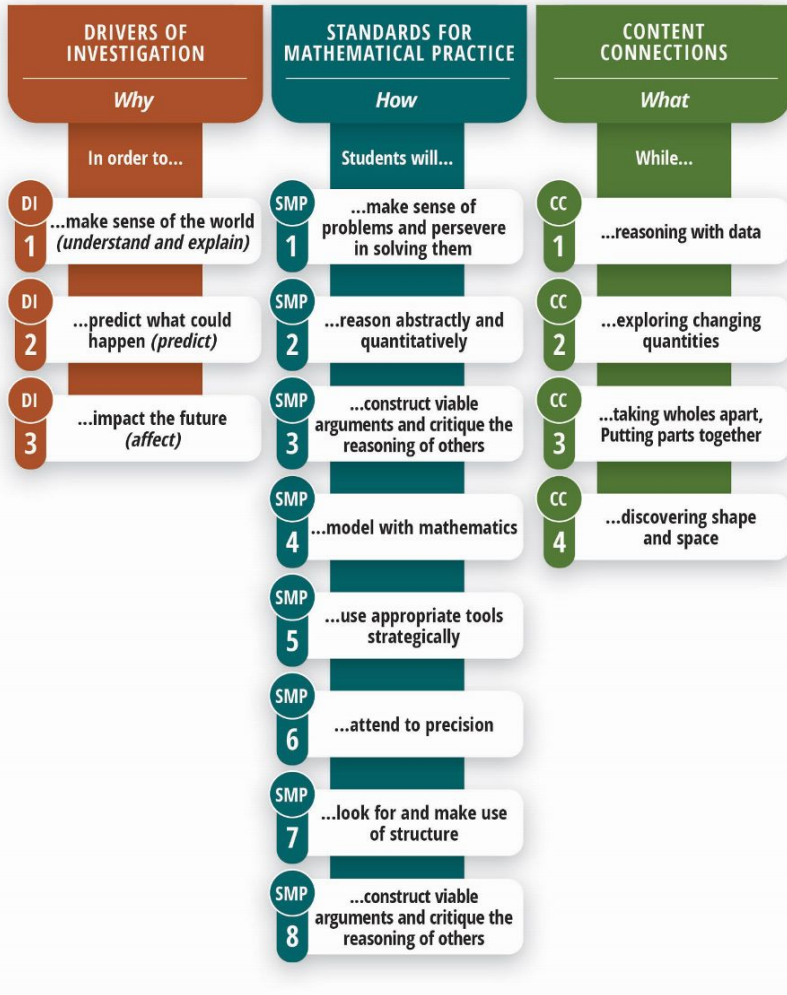
Hold high expectations for all students and avoid deficit views of diverse learners.

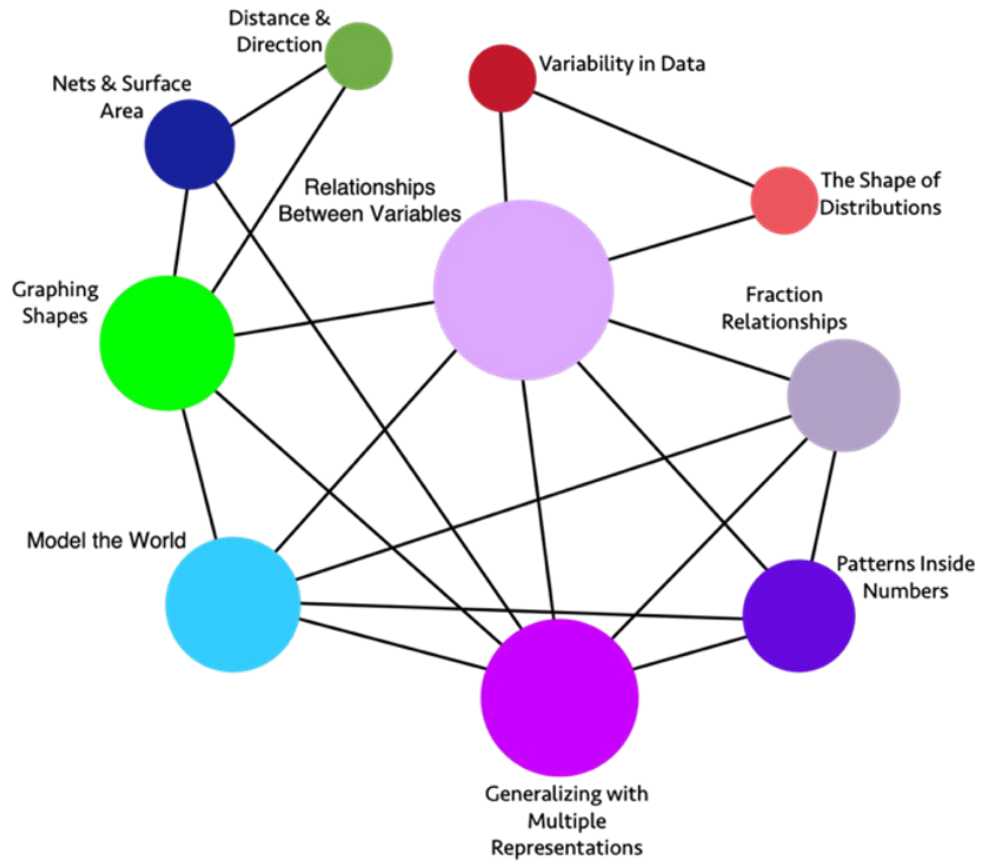
*Mathematics Framework* Revised Draft  
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 Welcome

# **Mathematics Framework**

## **Chapter 1: Mathematics for All: Purpose, Understanding, and Connection**





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# **Mathematics Framework**

## **Chapter 2: Teaching for Equity and Engagement**



# **Chapter 2-Teaching For Equity and Engagement**

The Need for Equity and Engagement



# Chapter 2-Teaching For Equity and Engagement

## Three Dimensions of Systemic Change That Support Mathematics Instruction

- An Assets Based Approach to Instruction
- Active Engagement Through Investigation and Connections
- Cultural and Personal Relevance

# Expect more

Hold high expectations for all students, and avoid deficit views of diverse learners.



Photo by [Sasin Tipchai](#) on [Pixabay](#)

# Expect more

## Using Assets-Based Language

- Include students' prior knowledge (cognitive and affective)
- Include student understandings
- Include outside of class attributes
- Avoid deficit thinking



Photo by Rebrand Cities

# Use Culturally Relevant Curricula

Use instructional materials in ways that help students see themselves as doers of mathematics and help them overcome the negative stereotypes and messages regarding who is mathematically smart.



# Continuum of Culturally Relevant Tasks

1. Start with good standards-based math tasks
2. Customize task with names that are meaningful to your students
3. Replace context with one that is engaging to your students
4. Empower your students to be agents of change



**Lower-level demands**  
**(memorization):**

- reproducing previously learned facts, rules, formulas, definitions or committing them to memory
- Cannot be solved with a procedure
- Have no connection to concepts or meaning that underlie the facts rules, formulas, or definitions

**Lower-level demands**  
**(procedures without connections):**

- are algorithmic
- require limited cognitive demand
- have no connection to the concepts or meaning that underlie the procedure
- focus on producing correct answers instead of understanding
- require no explanations

**Higher-level demands**  
**(procedures with connections):**

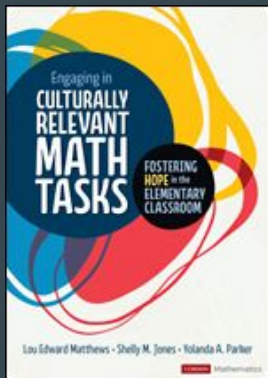
- use procedure for deeper understanding of concepts
- broad procedures connected to ideas instead narrow algorithms
- usually represented in different ways
- require some degree of cognitive effort; procedures may be used but not mindlessly

**Higher-level demands**  
**(doing mathematics):**

- require complex non-algorithmic thinking
- require students to explore and understand the mathematics
- demand self-monitoring of one's cognitive process
- require considerable cognitive effort and may involve some level of anxiety b/c solution path isn't clear



# Contexts That Inspire Culturally Relevant Math Tasks



# HOPE WHEEL



A PLANNING TOOL FOR CREATING  
CULTURALLY RELEVANT EXPERIENCES

# Contexts That Inspire Culturally Relevant Math Tasks

Love	Invest	Inspire	Create	Restore	Protest
<ul style="list-style-type: none"><li>• Nurture</li><li>• Care for</li><li>• Embrace</li><li>• Sustain</li><li>• Maintain</li><li>• Grow</li><li>• Appreciate</li></ul>	<ul style="list-style-type: none"><li>• Set up</li><li>• Support</li><li>• Mentor</li><li>• Reallocate</li></ul>	<ul style="list-style-type: none"><li>• Move</li><li>• Empower</li><li>• Model</li><li>• Encourage</li></ul>	<ul style="list-style-type: none"><li>• Innovate</li><li>• Imagine</li><li>• Establish</li><li>• Frame</li><li>• Design</li><li>• Build</li></ul>	<ul style="list-style-type: none"><li>• Salvage</li><li>• Apologize</li><li>• Repair</li><li>• Illuminate</li><li>• Amplify</li><li>• Forgive</li></ul>	<ul style="list-style-type: none"><li>• Resist</li><li>• Dismantle</li><li>• Disrupt</li><li>• Interrupt</li><li>• Speak up</li><li>• Stand up</li></ul>

# Chapter 2-Teaching For Equity and Engagement

## Five Components of Equitable and Engaging Teaching for All Students

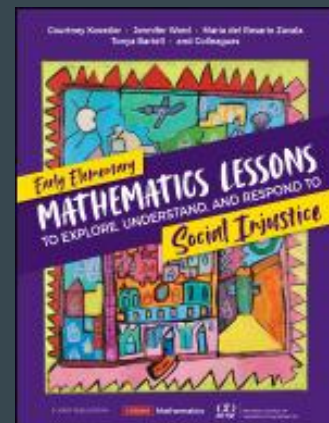
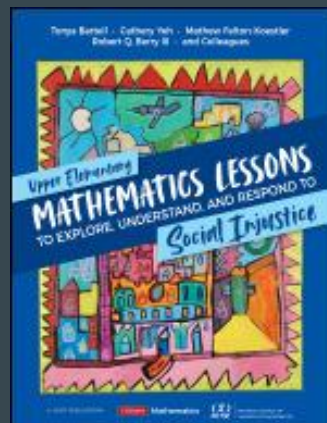
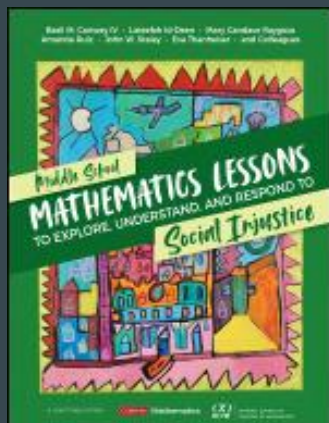
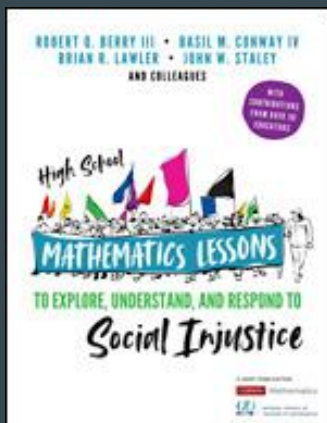
- Plan Teaching Around Big Ideas
- Use Open, Engaging Tasks
- Teach Toward Social Justice
- Invite Student Questions and Conjectures
- Prioritize Reasoning and Justification

# Stage 1 Tasks

- [Achieve the Core](#)
- [Illustrative Mathematics](#)
- [Nrich](#)
- [Youcubed](#)

# Stage 4 Tasks

Empower your students to be agents of change



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# **Mathematics Framework**

## **Chapter 9: Structuring School Experiences for Equity and Engagement**

# Chapter 9-Structuring School Experiences for Equity and Engagement

- Access to rigorous mathematics for all
- Support For All Students With Flexible Teaching Structures
- Strategies for teaching diverse students
- Multi-dimensional teaching



# Expect more

## Being a Warm Demander

### Academic Press

- Content is made clear
- High Expectations
- Students held accountable for performance
- Students provided assistance needed to achieve



Photo by Julia Larson



# Expect more

## Being a Warm Demander

### Social Support

- Strong Social Relationships
  - Trust
  - Confidence
  - Psychological Safety
    - Risk Taking
      - Admitting errors
      - Asking for help
      - Experiencing failure



Photo by Agung Pandit Wiguna

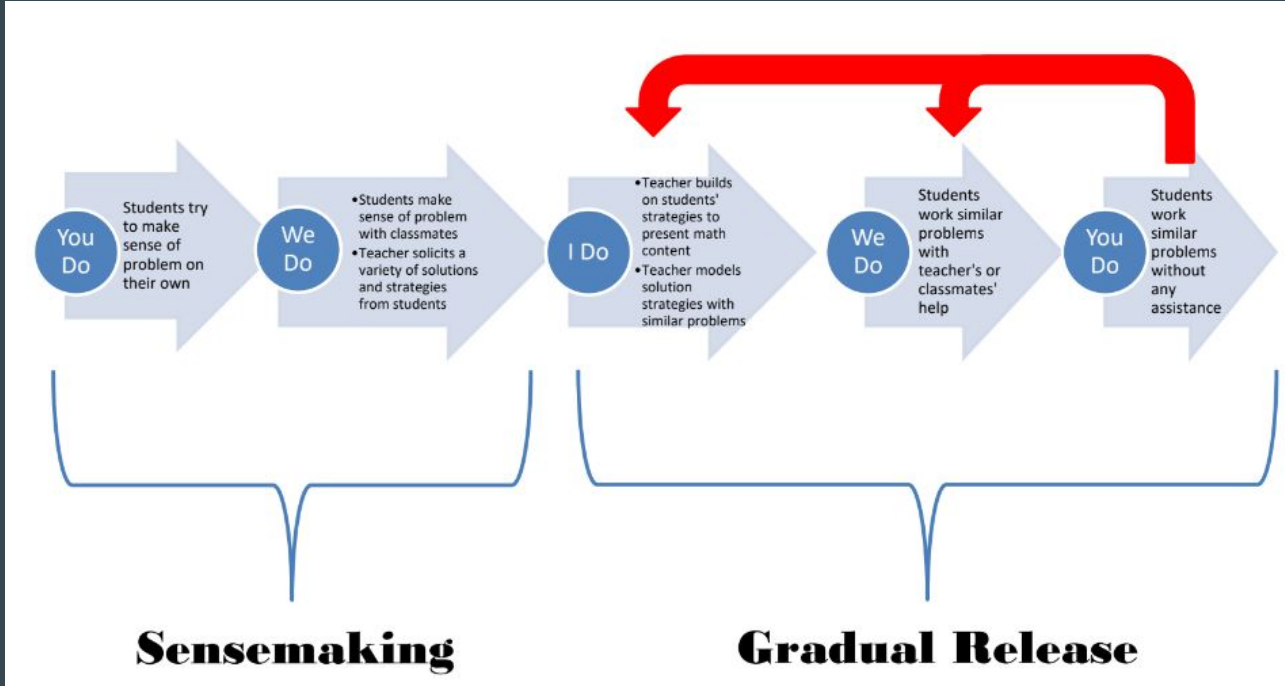
# Release Control

Empower your students to take ownership of their learning by focusing on sensemaking and allow them to make choices about things that are important to them in the classroom.

Photo by [Diego PH](#) on [Unsplash](#)



# Instructional Progression for Math



# Totally Ten Choice Boards

## Elementary Example

### Score 2

Evaluate:  $25 + 32$

Evaluate:  $45 - 27$

Evaluate:  $17 \times 26$

### Score 4

Create an addition problem that will result in the following answer: 833

Create a subtraction problem that will result in the following answer: 211

Create a multiplication problem that will result in the following answer: 544

### Score 6

Create a division word problem that will result in the following answer: 13

### Score 8

Create a problem for each operation (addition, subtraction, multiplication, and division) that will result in the following answer: 242

## Secondary Example

### Score 2

Simplify:  $(6x - 2) + (9x^2 + 6x)$

Simplify:  $(4x^2 - 5) - (x^2 + 2x - 7)$

Simplify:  $-7x^2y(3x^2y - 2xy^2 - 6y^3)$

### Score 4

Create an addition polynomial problem that will result in the following answer:  $8a^2 + 3a + 3$

Create a subtraction polynomial problem that will result in the following answer:

$-5c^3 + 2c^2 - c + 11$

Create a multiplication polynomial problem that will result in the following answer:  $72b^2 - 119b + 49$

### Score 6

Create a volume polynomial problem that will result in the following answer:  $2s^3 + 13s^2 + 6s$

### Score 8

Create a polynomial problem for each operation (addition, subtraction, multiplication, and division) that will result in the following answer:  $2x^3 + 13x^2 - x + 42$

# Chapter 5-Data Science



Introduction to Data Science

- What is Data Science?

Data science combines math and statistics, specialized programming, advanced analytics, artificial intelligence (AI), and machine learning with specific subject matter expertise to uncover actionable insights hidden in ... data.

(<https://www.ibm.com/topics/data-science> retrieved 7/26/23)



# Chapter 5-Data Science



Introduction to Data Science

## Why Data Science?

- We are living in the age of information! Every second of every day, the world creates enough data to fill 50 new libraries of congress.
- 40% of US Companies report difficulty in filling positions because of a lack of STEM Skills
- Data Literacy and Data Science skills are absolutely essential in order to be considered literate in today's society and to become engaged citizens.
- Data science exposes students to new and different kinds of content that can energize and motivate them, and enable them to see a use for mathematics to make sense of the world around them.

# Chapter 5-Data Science



Introduction to Data Science

## Impact of Data Science

**Twelfth Grade Math and College Access-Los Angeles Educational Research Institute-UCLA**  
(January 2023)

- This report studied the implementation of two alternative math courses implemented in LAUSD, Transition to College Mathematics and Statistics (TCMS) and IDS.
- Compared to students who took Precalculus, students who were otherwise similar at the end of 11th grade but took IDS earned slightly higher GPAs (by about .05 weighted GPA points).
- The study found no statistically significant differences in college enrollment for similar students who took IDS instead of Precalculus.

# CMP and the Framework Rollout

- Partner with CISC, CMC
- Create PD Modules
- Fee For Service
- County Offices of Education
- Multi-Year Rollout



Q&A

## Framework K-W-L

K	W	L

# Thank You!

- Website: [www.cmpso.org](http://www.cmpso.org)
- Join the *Choosing to See Math Equity* Facebook Group:  
<https://www.facebook.com/groups/372602544251069>

