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

<table>
<thead>
<tr>
<th>K</th>
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<tbody>
<tr>
<td>ICUCARE Equity Framework</td>
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<tr>
<td>Include others as experts</td>
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<tr>
<td>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.</td>
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<tr>
<td>Be Critically Conscious</td>
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<tr>
<td>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.</td>
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<td>Understand your students well</td>
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<tr>
<td>Learn about your students, their families and their communities for the purpose of improving instruction. (Not making assumptions)</td>
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<tr>
<td>Use Culturally relevant curricula</td>
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<tr>
<td>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.</td>
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<tr>
<td>Assess, Activate and build on prior knowledge</td>
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<td>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.</td>
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<td>Release control</td>
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<td>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.</td>
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<td>Expect more</td>
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<tr>
<td>Hold high expectations for all students and avoid deficit views of diverse learners.</td>
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**Image:** A book with the title "Choosing To See: A Framework for Equity in the Math Classroom."
Mathematics Framework
Chapter 1: Mathematics for All: Purpose, Understanding, and Connection
Mathematics Framework
Chapter 2: Teaching for Equity and Engagement
<table>
<thead>
<tr>
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<td>Students with Disability</td>
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</tbody>
</table>
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
<table>
<thead>
<tr>
<th>Lower-level demands (memorization):</th>
<th>Lower-level demands (procedures without connections):</th>
</tr>
</thead>
<tbody>
<tr>
<td>• reproducing previously learned facts, rules, formulas, definitions or committing them to memory</td>
<td>• are algorithmic</td>
</tr>
<tr>
<td>• Cannot be solved with a procedure</td>
<td>• require limited cognitive demand</td>
</tr>
<tr>
<td>• Have no connection to concepts or meaning that underlie the facts rules, formulas, or definitions</td>
<td>• have no connection to the concepts or meaning that underlie the procedure</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Higher-level demands (procedures with connections):</th>
<th>Higher-level demands (doing mathematics):</th>
</tr>
</thead>
<tbody>
<tr>
<td>• use procedure for deeper understanding of concepts</td>
<td>• require complex non-algorithmic thinking</td>
</tr>
<tr>
<td>• broad procedures connected to ideas instead narrow algorithms</td>
<td>• require students to explore and understand the mathematics</td>
</tr>
<tr>
<td>• usually represented in different ways</td>
<td>• demand self-monitoring of one’s cognitive process</td>
</tr>
<tr>
<td>• require some degree of cognitive effort; procedures may be used but not mindlessly</td>
<td>• require considerable cognitive effort and may involve some level of anxiety b/c solution path isn’t clear</td>
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</table>
Contexts That Inspire Culturally Relevant Math Tasks
# Contexts That Inspire Culturally Relevant Math Tasks

<table>
<thead>
<tr>
<th>Love</th>
<th>Invest</th>
<th>Inspire</th>
<th>Create</th>
<th>Restore</th>
<th>Protest</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Nurture</td>
<td>● Set up</td>
<td>● Move</td>
<td>● Innovate</td>
<td>● Salvage</td>
<td>● Resist</td>
</tr>
<tr>
<td>● Care for</td>
<td>● Support</td>
<td>● Empower</td>
<td>● Imagine</td>
<td>● Apologize</td>
<td>● Dismantle</td>
</tr>
<tr>
<td>● Embrace</td>
<td>● Mentor</td>
<td>● Model</td>
<td>● Establish</td>
<td>● Repair</td>
<td>● Disrupt</td>
</tr>
<tr>
<td>● Sustain</td>
<td>● Reallocate</td>
<td>● Encourage</td>
<td>● Frame</td>
<td>● Illuminate</td>
<td>● Interrupt</td>
</tr>
<tr>
<td>● Maintain</td>
<td>● Move</td>
<td>● Inspire</td>
<td>● Design</td>
<td>● Amplify</td>
<td>● Speak up</td>
</tr>
<tr>
<td>● Grow</td>
<td>● Support</td>
<td>● Empower</td>
<td>● Build</td>
<td>● Forgive</td>
<td>● Stand up</td>
</tr>
<tr>
<td>● Appreciate</td>
<td>● Mentor</td>
<td>● Model</td>
<td></td>
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</tbody>
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- **Love**
  - Nurture
  - Care for
  - Embrace
  - Sustain
  - Maintain
  - Grow
  - Appreciate

- **Invest**
  - Set up
  - Support
  - Mentor
  - Reallocate

- **Inspire**
  - Move
  - Empower
  - Model
  - Encourage

- **Create**
  - Innovate
  - Imagine
  - Establish
  - Frame
  - Design
  - Build

- **Restore**
  - Salvage
  - Apologize
  - Repair
  - Illuminate
  - Amplify
  - Forgive

- **Protest**
  - Resist
  - Dismantle
  - Disrupt
  - Interrupt
  - Speak up
  - Stand up
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
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
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.
Instructional Progression for Math

You Do
Students try to make sense of problem on their own

We Do
• Students make sense of problem with classmates
• Teacher solicits a variety of solutions and strategies from students

I Do
• Teacher builds on students’ strategies to present math content
• Teacher models solution strategies with similar problems

You Do
Students work similar problems with teacher’s or classmates’ help

We Do
Students work similar problems without any assistance

Sensemaking
Gradual Release
## Totally Ten Choice Boards

### Elementary Example

| Score 2       | Evaluate: 25 + 32  
|               | Evaluate: 45 – 27  
|               | Evaluate: 17 × 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: \(-7x^2 y(3x^2 y - 2xy^2 - 6y^3)\)  |

| 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

- 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.

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

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

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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](https://www.facebook.com/groups/372602544251069)