THE MATHEMATICS OF OPPORTUNITY

November 5, 2018

The David Brower Center

Just Equations

a project of the Opportunity Institute

OPPORTUNITY INSTITUTE

We advance economic and social upward mobility, focusing primarily on the use of cradle-to-career education as a tool to help eradicate poverty and racial inequality.

Re-conceptualizing the role of math in ensuring educational equity

Our Values

Evidence

Equity

Rigor

Alignment

Our Strategies

- **Sense-making** through analyzing evidence and synthesizing research
- **Agenda-setting and raising awareness** through strategic communications
- **Bridge-building** through convening, dialogue, and partnerships
- **Strategic advice** on math opportunity issues

Our Core Partners

OPPORTUNITY INSTITUTE

The Campaign for College Opportunity

The Education Trust–West

LearningWorks
linking knowledge, policy and practice

PACE
Policy Analysis for California Education

Other Partners

The James Irvine Foundation

COLLEGE FUTURES FOUNDATION
More Graduates for a Thriving California

- Advisors & Collaborators
- YOU!

Goal for today

Advance the role of math in fostering, not limiting, equity by:

- Deepening thinking about role of math in educational equity, and the goal of equity in math education
- Building a common conversation across educational segments about strategies to advance math equity
- Highlighting ways that policy and evidence can help improve the effectiveness of math education in promoting educational equity

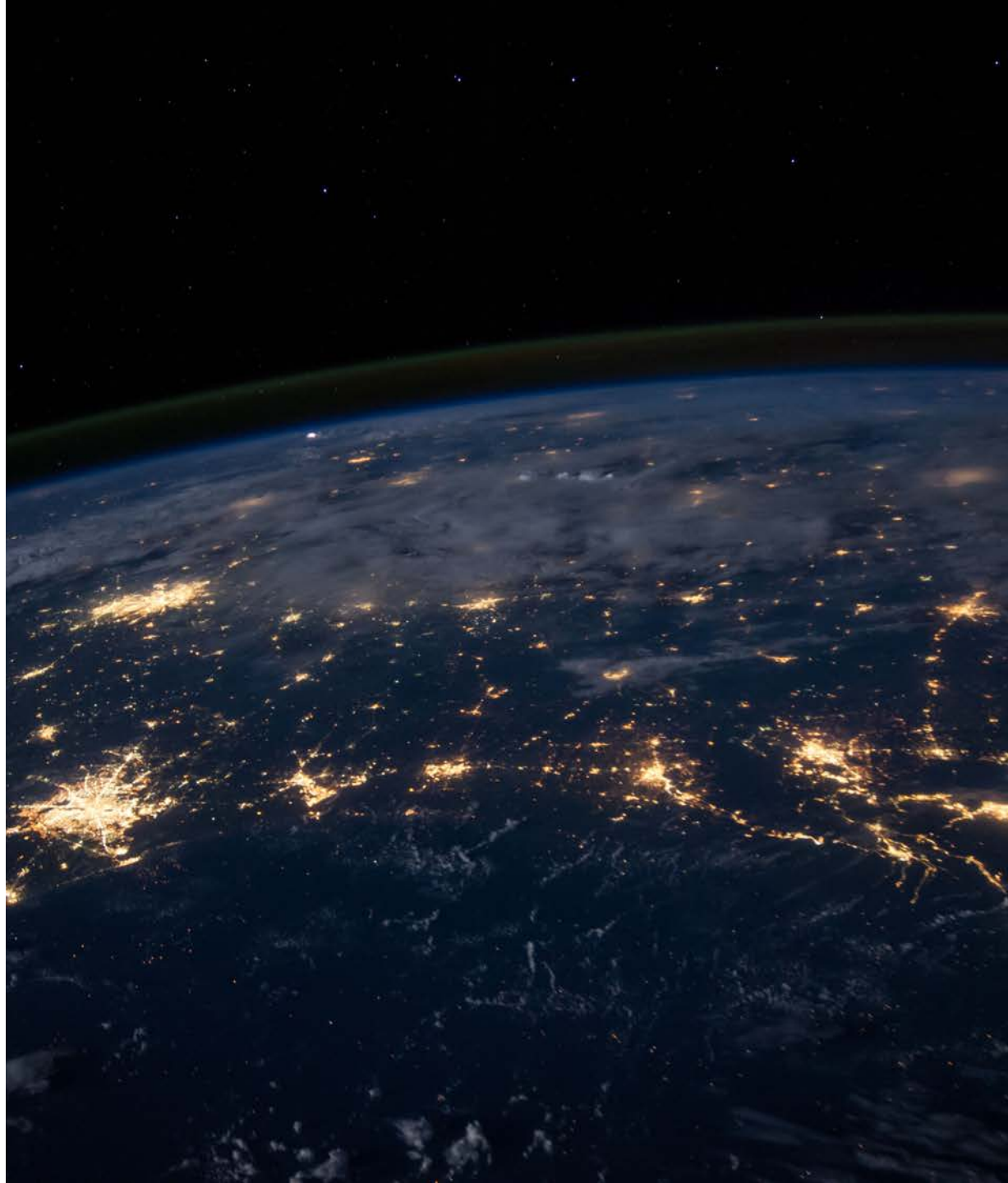
Why Mathematics?

It’s the “After Math”

“Who is putting the math books in the horror section?”

Purpose of Math

- Expand professional opportunity
- Understand and critique the world
- Experience wonder, joy, and beauty

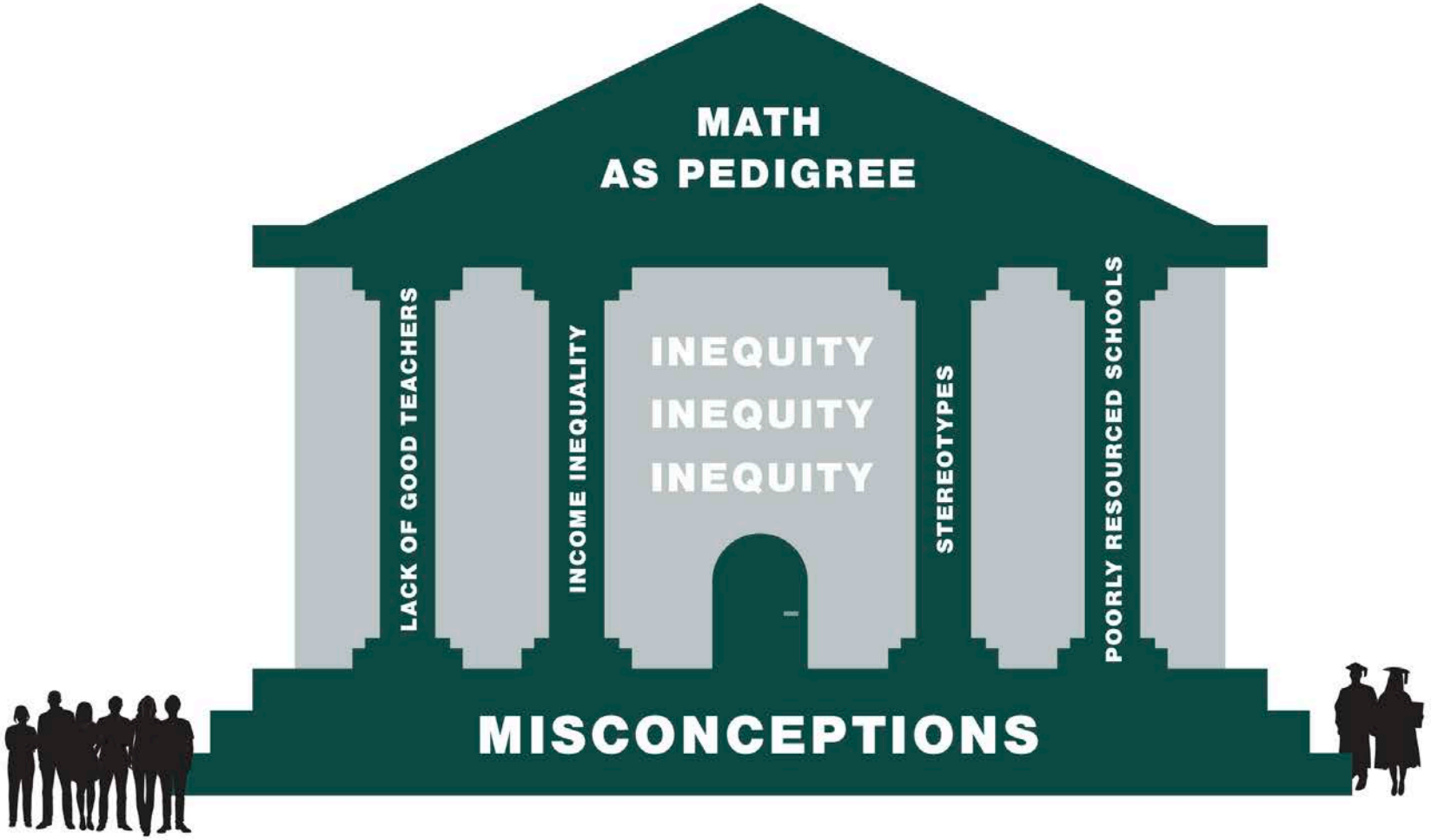


Equity in Mathematics?

"the inability to predict mathematics achievement and participation based solely on student characteristics such as race, class, ethnicity, sex, beliefs, and proficiency in the dominant language"

-Rochelle Gutierrez

Architecture of Math Opportunity



Misconceptions about Math Skill

Misconceptions about Math Skill

- **Math ability is innate**: Only some people are good at math.
- **There is a right way to do math**: It lacks creativity or expression.
- **Speed and acceleration matter**: Process and depth are secondary.

Existing Educational Inequities

- Poorly-resourced schools
- Differential access to strong curriculum, good teachers
- Income inequality
- Insufficient support for students' needs
- Existing bias and stereotype threat
- Psychic effects on students of the above

Math as Pedigree

Math as Pedigree

Pedigree preserves the position of individuals and groups that already enjoy privilege.

Preparation is intended to provide individuals the foundation they need to succeed at the next level.

Math Opportunity Impacts

- Course-taking,
- Earning high school diploma
- Earning acceptance to college, esp. selective college
- Taking non-remedial math courses upon college entry
- Entering desired programs, and ultimately
- Earning college degree that confers access to career & opportunities

NAVIGATING MATH JOURNEYS

Jessie Ryan, Campaign for College Opportunity
Javier Cabral, Journalist

REFLECTING ON YOUR MATH JOURNEYS

PLEASE PAIR UP WITH A PARTNER AND SHARE:

- What were critical points on your mathematics journey?
- How has math education helped or hindered you in your life and career?
- What are you doing/would you like to be doing to ensure more students have a positive experience of math?

(If preferred, feel free to do this exercise with a student or family member in mind)

BREAK

Please be back at 10:20

MATH EDUCATION IDEALS & REALITIES:
An Equity & Policy Dialogue

Christopher Edley, Jr., Opportunity Institute, UC-Berkeley
Michael W. Kirst, California State Board of Education, Stanford University
Alexandra W. Logue, City University of New York
Eloy Ortiz Oakley, California Community Colleges, UC Board of Regents

REFLECTIONS BEFORE LUNCH

Improving the Role of Math in Fostering Equity:

Please use the YELLOW notecard in your folder

- Please write down the most important idea you heard or that occurred to you during this morning's conversation.

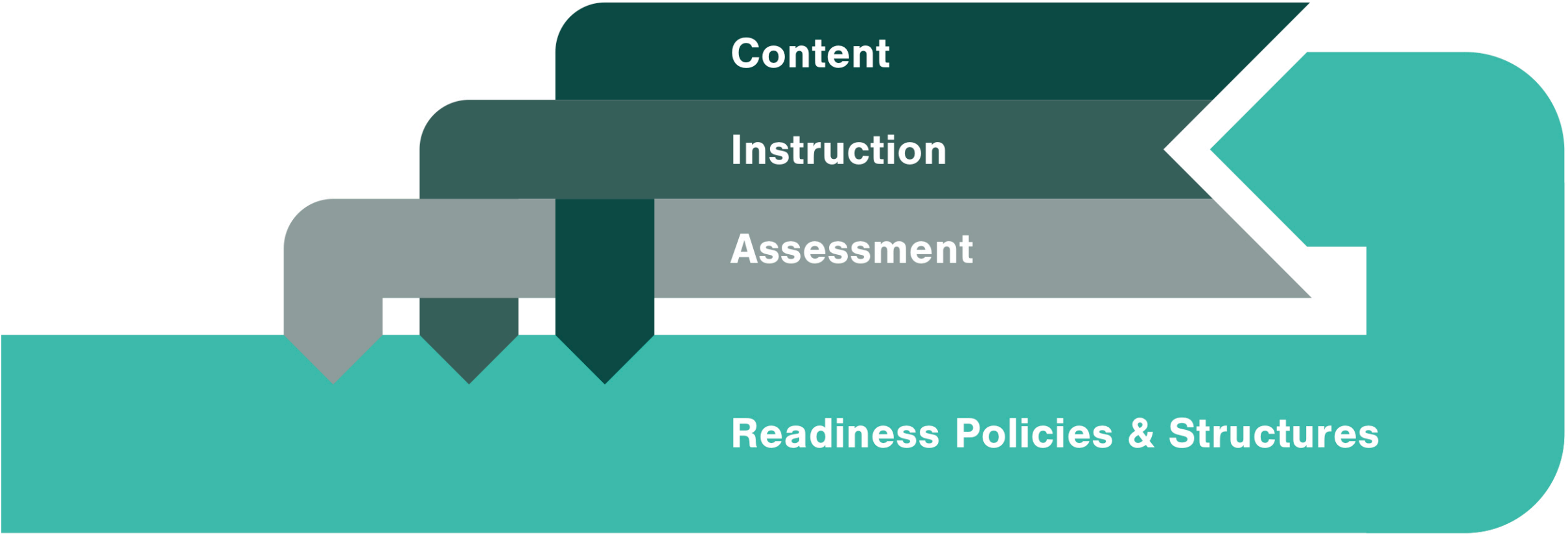
(Name is optional)

LUNCH

in the Gallery

See you back here at 12:45!

Four Equity Dimensions of Math Education

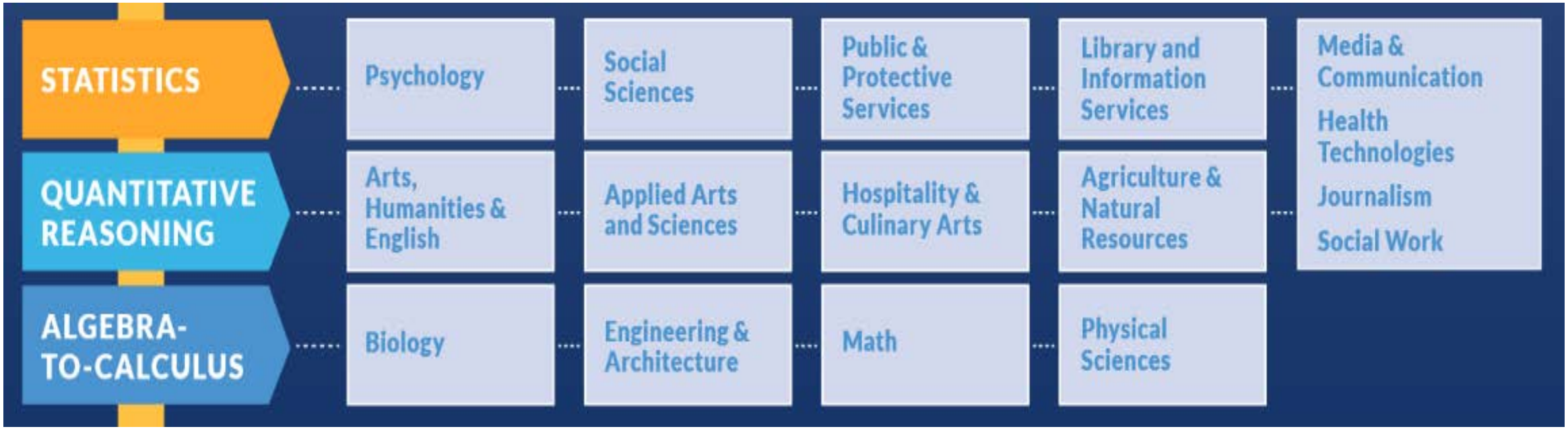


Rethinking **Content**

Math **Content**

- Rigor, relevance
- Traditional Algebra-to-Calculus pathway
- Diversified math pathways, such as
  - statistics
  - mathematics modeling
  - data science
- Equity & access to STEM fields

Rethinking Postsecondary **Math Pathways**



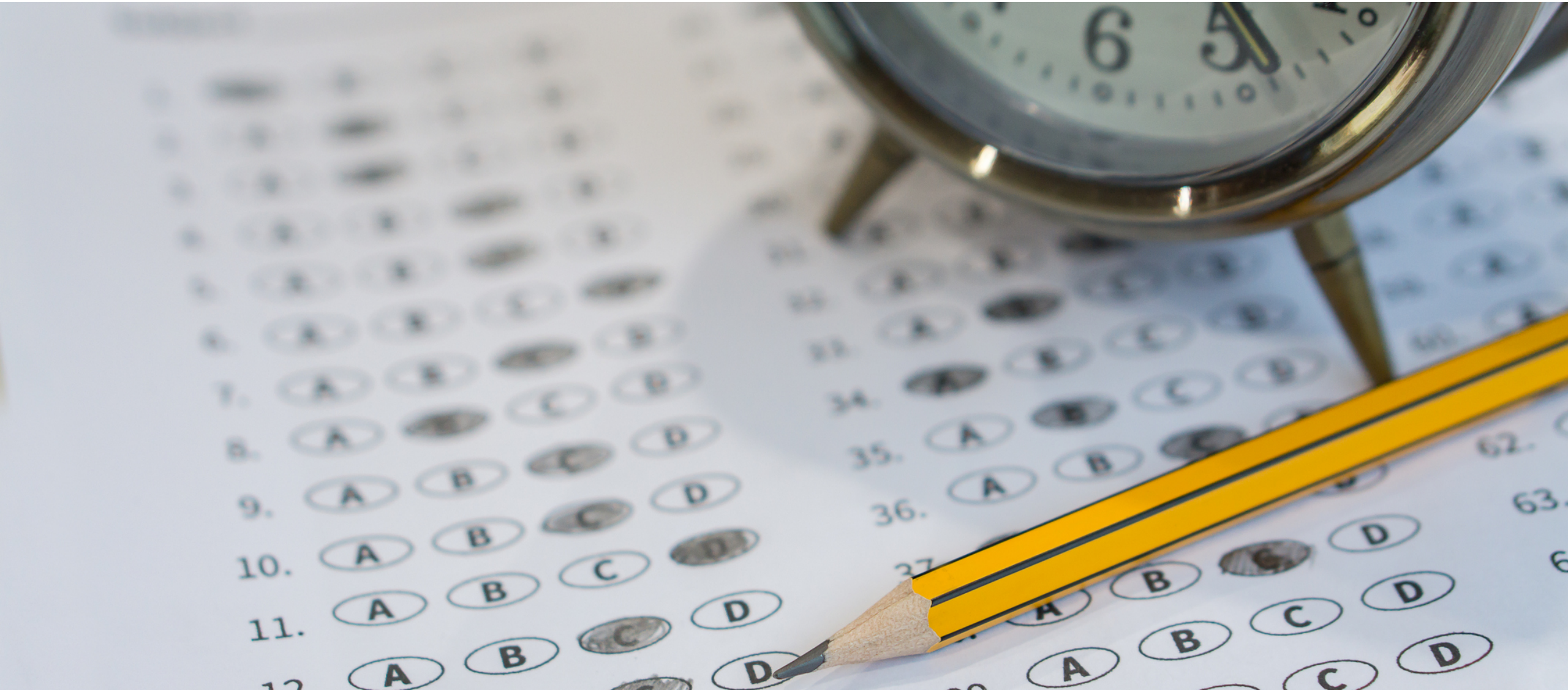
Source: WestEd, Just Equations 2018

Rethinking **Instruction**

performance	**learning**
speed	**depth**
symbolic	**multi-representational**
elite	**equitable**
ability	**effort**
“giftedness”	**everyone can learn**
tests and grades	**feedback for learning**
formulas	**thought**
procedures	**creativity**
answer	**process**

See Jo Boaler, Stanford University

Rethinking **Assessment**



Rethinking **Assessment**

- High stakes vs. low stakes
- Timed tests
- Bubble tests vs. performance assessments
- Disparate impact
- Uses: admissions, placement, learning





Rethinking **Readiness Policies**

- **High school** placement, tracking, acceleration, and graduation policies
- **Postsecondary** admissions, placement, general education, transfer, and graduation policies

California's Readiness Policies

Milestone	Years Required	Including	New Pathways?
High school graduation	2	Algebra 1	
Common Core	3 (4 recommended)	Algebra 2	
UC/CSU admission	3 (4 recommended)	Algebra 2	Data science can count
FUTURE: *UC/CSU admission*	*4 ??*	*Algebra 2??*	*Data science?* *Computer science?* *Personal finance?*

YOU = **New** Architects of Math Opportunity

Equity Principles - *forthcoming*

DEEP DIVE SESSIONS

KEY QUESTIONS:

- ***What research is most needed*** *in this area to support effective policy and practice?*

- ***What is the best role for policy*** *(state and/or system) to advance equity and support effective practice?*

DEEP DIVE SESSIONS - A
(Kinzie Room A)

CONTENT - New Math Pathways & College Success

A1. Implementing new math pathways through AB 705 and EO 1100 (1:15- 2:30)

Amy Getz, Charles A. Dana Center – FACILITATOR

Myra Snell, California Acceleration Project, Los Medanos College

Sonja Manor, California State University-Humboldt

A2. Emerging high school math pathways (2:45 – 4:00)

Phil Daro, SERP Institute – FACILITATOR

Suyen Machado, Center X, University of California-Los Angeles

Ho Nguyen, San Francisco Unified School District

DEEP DIVE SESSIONS - B
(Kinzie Room B)

INSTRUCTION & ASSESSMENT: Increasing Math Equity

B1. Math Assessment to Enhance Learning (1:15 – 2:30)

Kimberly Samaniego, Math Diagnostic Testing Project, UCSD - FACILITATOR
Theresa Morris, California Performance Assessment Collaborative
Kimberly Seashore, San Francisco State University

B2. Math Pedagogy for Equity (2:45 – 4:00)

Ravin Pan, Sacramento State University - FACILITATOR
Karen Mayfield-Ingram, UC Berkeley, Lawrence Hall of Science
Vanson Nguyen, College of Alameda

DEEP DIVE SESSIONS - C
(Goldman Theater)

READINESS POLICIES: Positioning Students for Success

C1. Four Years of High School Math: Implications for College Access & Readiness (1:15 – 2:30)

Chris Nellum, Education Trust-West - FACILITATOR

Michal Kurlaender & Minahil Asim, University of California-Davis, PACE

Rick Ford, CSU-Chico, Academic Senate APEP Committee

Christina Espinosa, Sacramento City Unified School District

C2. Readiness & Alignment: Moving Beyond Tests for Placement (2:45 – 4:00)

Linda Collins, Career Ladders Project – FACILITATOR

Tatiana Melguizo, University of Southern California

John Hetts, Educational Research Partnership

Joy Salvetti, Sacramento State University

DESIGNING MATH FOR OPPORTUNITY

System Representatives

Zulmara Cline, California State University
Stephanie Gregson, California Department of Education
Monica Lin, University of California
Alice Perez, California Community Colleges

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THANK YOU FOR BEING ARCHITECTS OF MATH OPPORTUNITY!