Higher Mathematics Course Pathways

Traditional vs. Integrated

CCSS Mathematics: Key Instructional Shifts

Focus

Coherence

Rigor (Conceptual, Procedural and Application)

CCSS Mathematics: Key Instructional Shifts

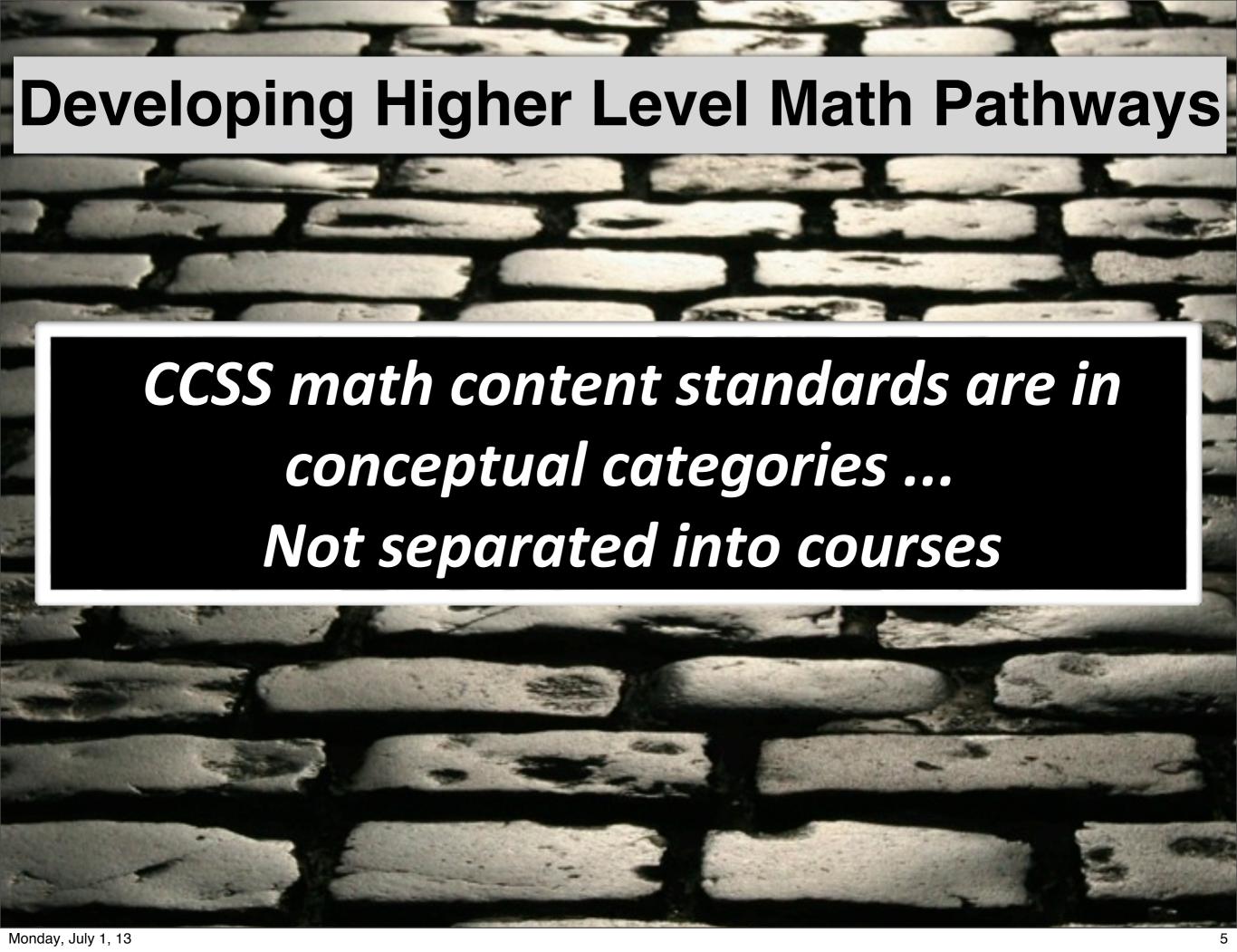
Coherence

- Connecting Between Topics
- Seeing Mathematical Structure
- Making Sense of Mathematics
- K-12 Progression of Learning

Coherence

Kindergarten	1	2	3	4	5	6	7	8	HS
8 Mathematical Practices – Students must be given opportunities to develop these practices at all levels.									
1 Make sense of problems and persevere in solving them. 2 Reason abstractly and quantitatively. 3 Construct viable arguments and critique the reasoning of others. 4 Model with mathematics. 5 Use appropriate tools strategically. 6 Attend to precision. 7 Look for and make use of structure. 8 Look for and express regularity in repeated reasoning.									
Content Domains from Kindergarten to Grade 8 – Progress to High School Conceptual Categories									
Counting and								Number and	
Cardinality (K)									Quantity (HS)
Number and Ratios and									
Operations in Base Ten (K – 5)						Proporti	ional		
Relationships (6 – 7)									
Number and Operations Fractions (3 – 5)						The Number System (6 – 8)			
Operations and Algebraic Thinking (K – 5)						Expressions and Equations			Algebra
					(6-8)			(content) (HS)	
								Functions (8)	
Geometry (K – 5)						Geomet	ry (6 – 8)		Geometry (HS)
Measurement and Data (K – 5)					Statistics and Probability			Stats/Prob	
WERYCHILD						(6-8)			(HS)
Kentucky Department of Education									

Kentucky Department of Education



CCSS Higher Level Math Conceptual Categories

- Number and Quantity
- Algebra
- Functions
- Geometry
- Statistics and Probability
- Modeling*

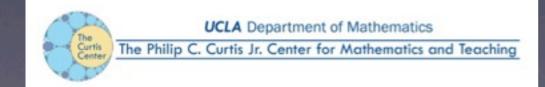
Traditional or Integrated?

Common Core Math Standards
At Every Grade Level K-8
Are Integrated

Not Your Father's Algebra I

(Based on Sample "Traditional" Pathway in CA Framework Draft)

Pre-Algebra ■"1997 Algebra 1B" ■Some "1997 Common Core Common Core ■"1997 Algebra 2A" Grade 8 Algebra 1 Geometry" Some Statistics Topics ■"1997 Algebra 1A" ■More "1997 High ■"1997 Algebra 2B" School Geometry" Transformational Common Core Common Core Introductory Trig Geometry Geometry Algebra 2 (sine, cosine) ■"1997 Algebra 2" Some AP Statistics Probability



- "Basically, in my mind, it shows that the new 'traditional' courses are:
- I. Poorly named, and
- 2. The new traditional courses are really at least semi-integrated."

Heather Dallas
UCLA Mathematics Department

Director, The Philip C. Curtis Jr. Center for Mathematics and Teaching CDE Mathematics Framework Committee member California Academic Content Standards Commission member

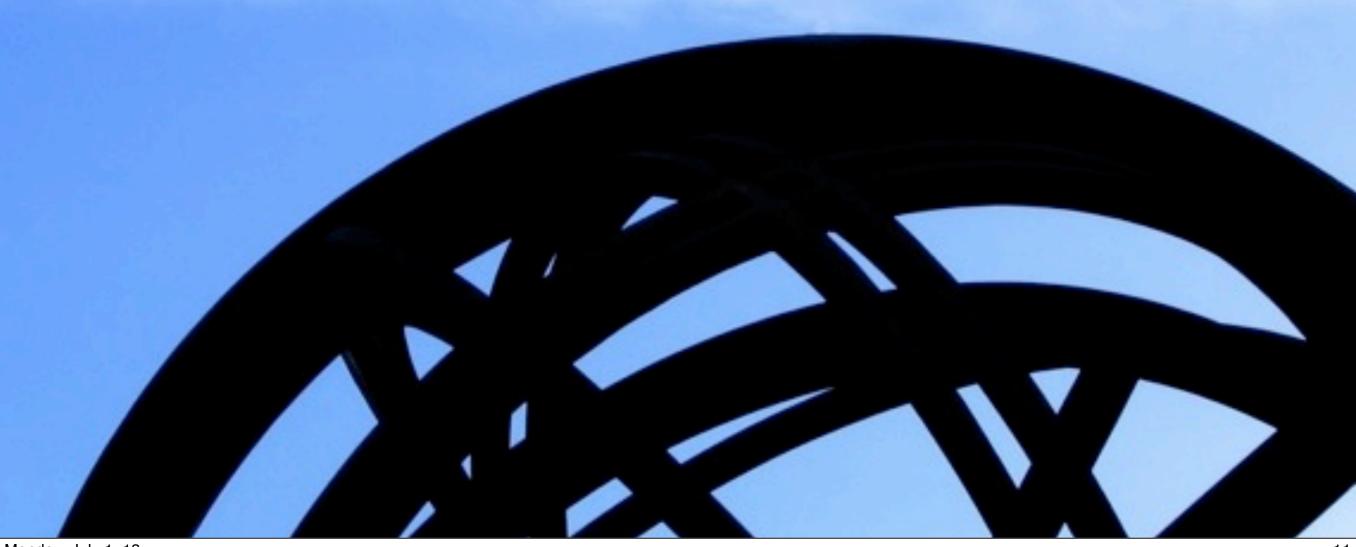
CDE's Higher Level Math Information Flyer

"Integration allows students to build proficiency and see connections and interrelationships between each domain, each year.

"Students enrolled in either pathway should arrive at the same point by the end of their third year of higher mathematics instruction."

CDE (June 2013)

Smarter Balanced Assessments College & Career Readiness <u>All 11th Graders</u> "Progress Towards..." 3rd-8th Graders



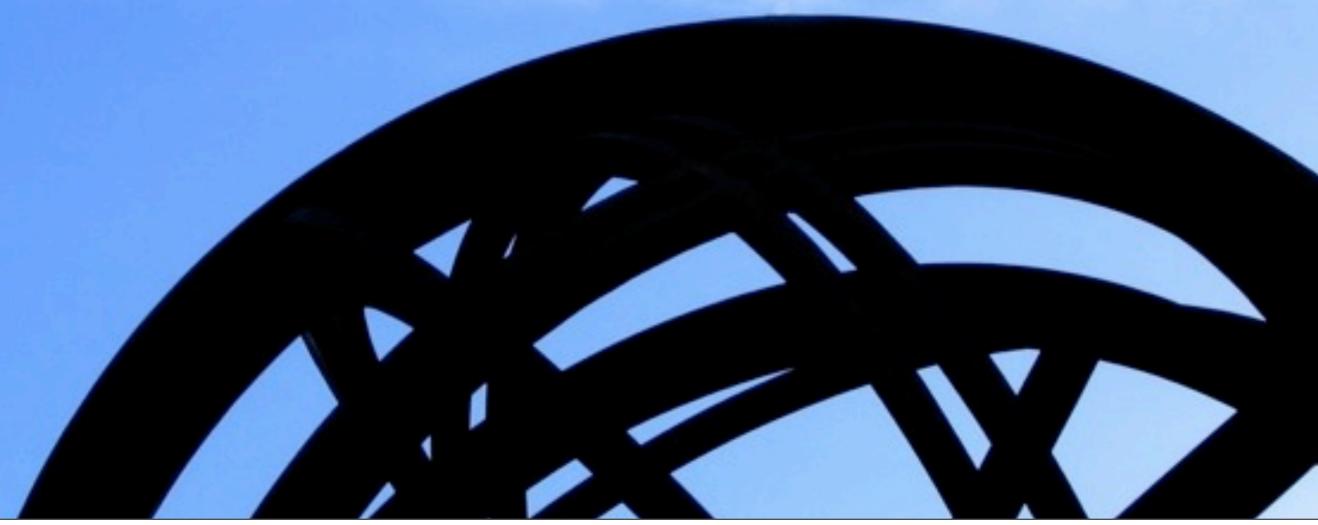
Smarter Balanced Assessments

Claim #1 – Concepts & Procedures

Claim #2 - Problem Solving

Claim #3 – Communicating Reasoning

Claim #4 - Modeling and Data Analysis



Smarter Balanced Assessments

Are Integrated



"Traditional" or Integrated?

- Same standards as integrated, different order
- "Old Way" → Comfortable (in name only?) → Need to learn what's new
- Our current "Traditional" textbooks are not CCSS aligned...supplementation is required
- Need to educate all stakeholders

- Same standards as traditional, different order
- New Way (to us) →
 Uncomfortable → Need to learn what's new
- CCSS Math K-8 and Smarter Balanced Assessments for Grades 3-8 and 11 are integrated
- Need to educate all stakeholders

How is the Coherence of Mathematics Best Preserved for Students?