Missouri Mathematics Core Academic Standards

Shift Two: Coherence

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Missouri
DEPARTMENT OF ELEMENTARY & SECONDARY
EDUCATION™

Core Academic Standards (CAS) Mathematics Shifts

Shift 1: **FOCUS**

Shift 2: **COHERENCE**

Shift 3: **RIGOR**

- **Conceptual Understanding**
- **Fluency**
- **Applications**

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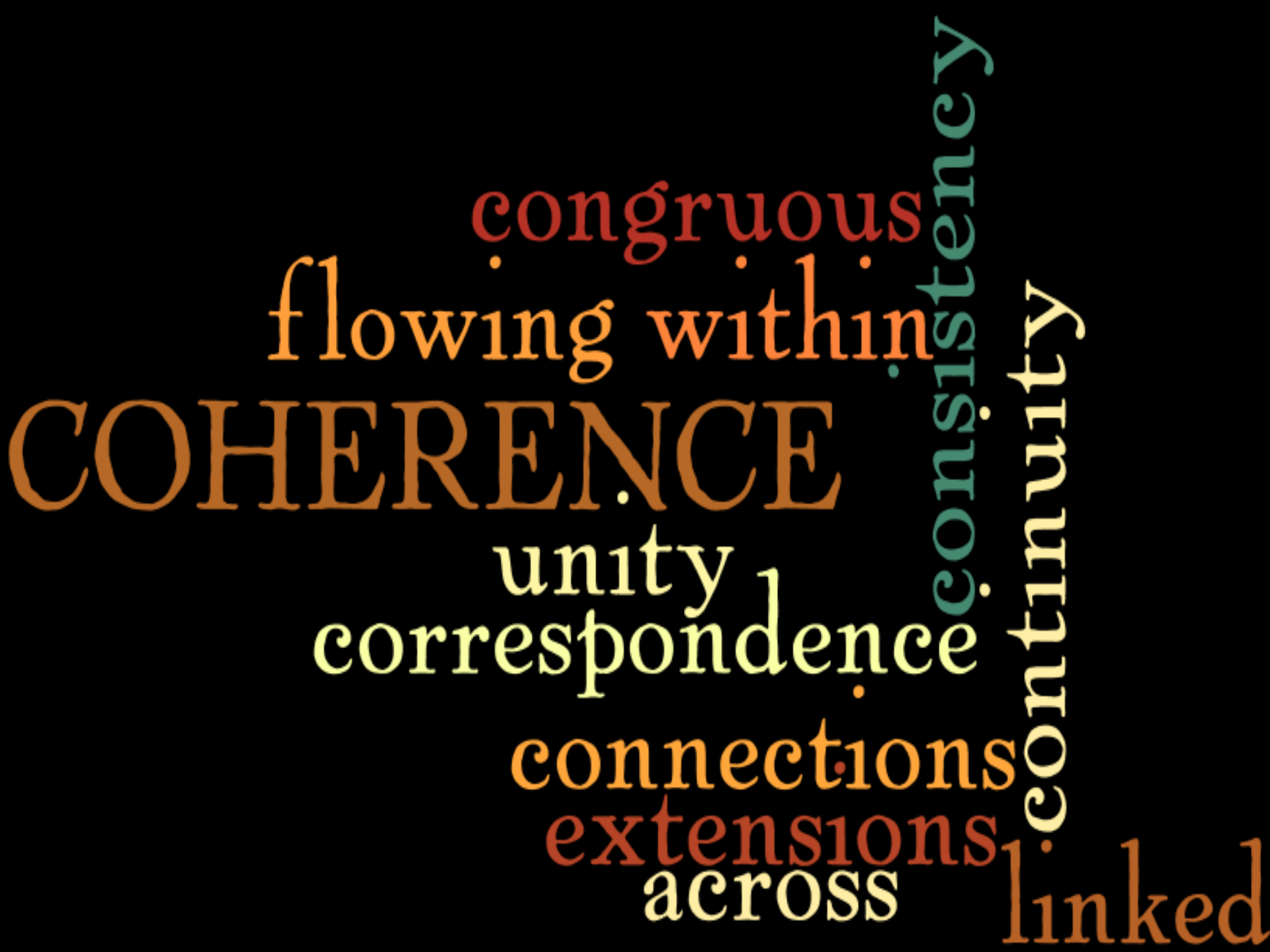
Session Overview

- Shift Two
- Rationale for Shift Two
- Curriculum Implications
- Resources
- Additional Information


congruous
flowing within
COHERENCE
unity
correspondence
connections
extensions
across
consistency
continuity
linked

Mathematics is coherent and sequential in nature.

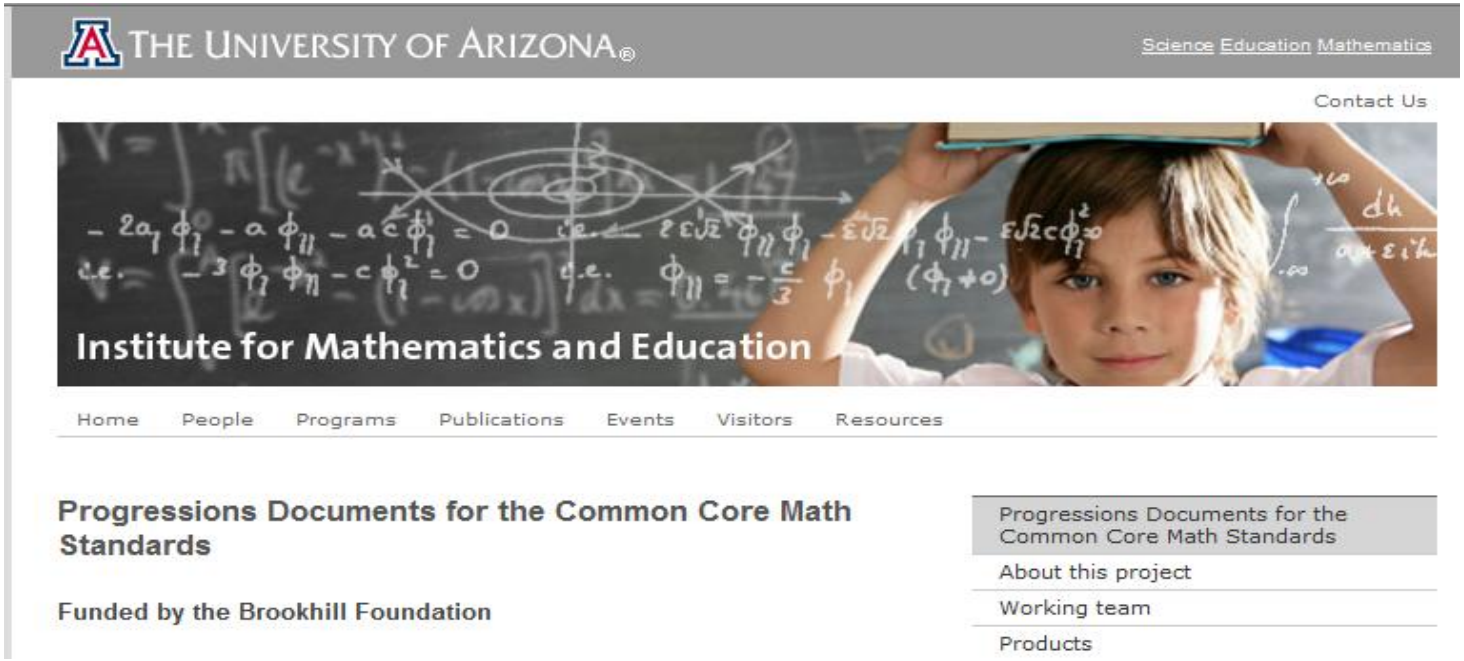
Mathematics CAS Shift 2: Coherence

Progressions Documents

Narrative documents:

- describing the progression of a topic across a number of grade levels
- informed both by research on children's cognitive development and by the logical structure of mathematics.

http://ime.math.arizona.edu/progressions/



Draft K–6 Progression on Geometry
Draft K–5 Progression on Measurement and Data (measurement part)
Draft K–5 progression on Measurement and Data (data part)
Draft K–5 Progression on Number and Operations in Base Ten
Draft K–5 Progression on Counting and Cardinality and Operations and Algebraic Thinking
Draft 3–5 progression on Number and Operations—Fractions
Draft 6–8 Progression on Statistics and Probability
Draft 6–8 Progression on Expressions and Equations
Draft 6–7 Progression on Ratios and Proportional Relationships
Draft High School Progression on Statistics and Probability

Mathematics CAS Shift 2: Coherence

A Grecian Urn

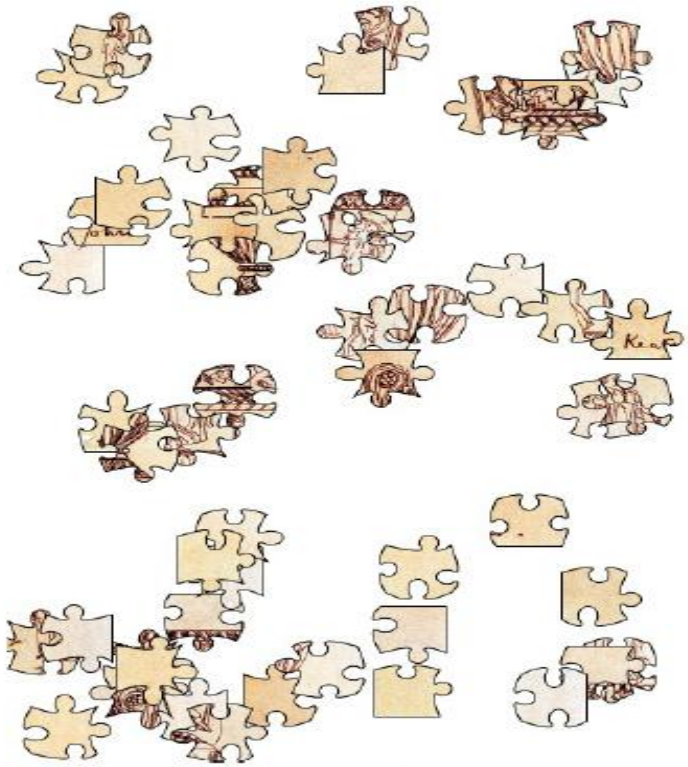
Comparing the Mathematics CAS to a Grecian Urn…

Phil Daro, Jason Zimba, and Bill McCallum

http://commoncoretools.me/2012/02/16/the-structure-is-the-standards/

Mathematics CAS Shift 2: Coherence

A Grecian Urn



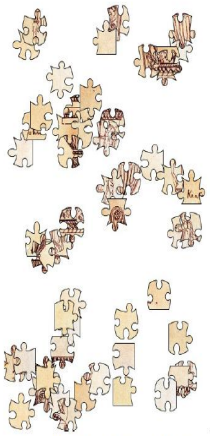
Standards for a Grecian Urn

Phil Daro, Jason Zimba, and Bill McCallum

http://commoncoretools.me/2012/02/16/the-structure-is-the-standards/

Mathematics CAS Shift 2: Coherence

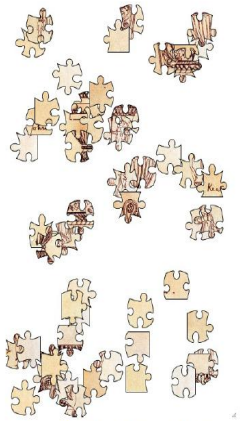
A Grecian Urn



Standards for a Grecian Urn

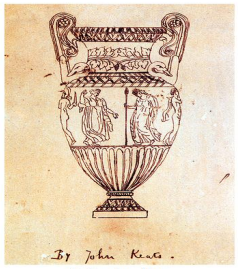
- Connect the learning within and across grades to build new understanding onto foundations built in the previous years.

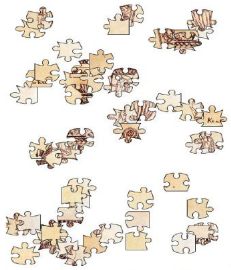
A Grecian Urn


Standards for a Grecian Urn

Coherence Within a Grade

For example, in seventh grade, understanding of ratio and proportion and their applications is related to understanding of equations.


A Grecian Urn


Standards for a Grecian Urn

Coherence Across the Grades

Grade 4	4.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.	
Grade 5	5.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.	5.NF.7 Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.
Grade 6		6.NS Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
		6.NS.1 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual models and equations to represent the problem.

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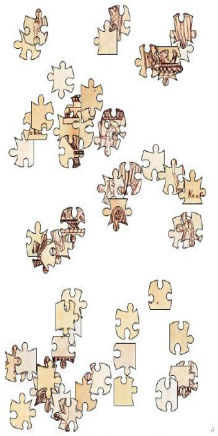
A Grecian Urn

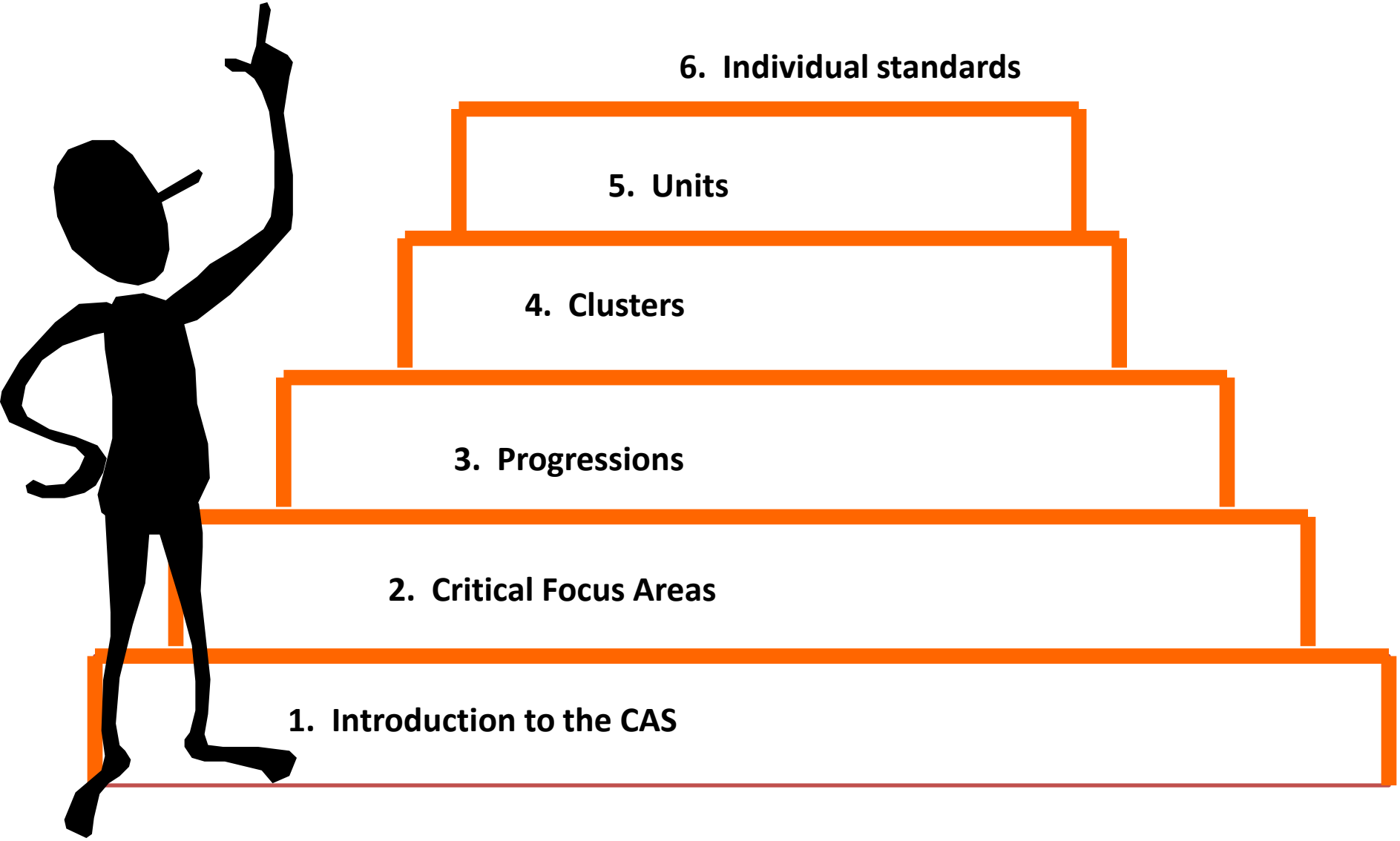


Standards for a Grecian Urn

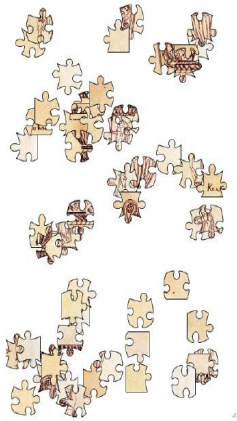
- Each standard is NOT a new event, but an extension of previous learning.

Picture This: The Mathematics Core Academic Standards Structure

Coherence: One Step at a Time



A Grecian Urn


Standards for a Grecian Urn

Avoiding Deconstructing Pitfalls

- Don’t attempt to deconstruct/clarify before having a deep understanding of the Standards as a whole.
- Allow teachers time, space, and resources to begin to digest and interpret the Standards into language and examples that make sense to them.
- Focus on implementing the Standards for Mathematical Practice.

Resources

- DESE Mathematics Core Academic Standards Resources
http://dese.mo.gov/divimprove/curriculum/common-core-math.htm
- *Progressions*
http://ime.math.arizona.edu/progressions/
- National Council of Teachers of Mathematics
www.nctm.org

Mathematics CAS Professional Learning Series Certified Trainers

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