COMMON CORE STATE STANDARDS IN MATHEMATICS

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OBJECTIVE:

1. Let's start at the beginning
2. Philosophy and Shifts for mathematics
3. Standards overview
4. Assessment overview

THE BEGINNING – NATIONALLY 3 MINUTES

You Tube - Hunt Institute - A New Foundation for Student Success

THE BEGINNING - NATIONALLY

- Council of Chief State School Officers (CCSSO): a nonpartisan, nationwide, nonprofit organization of public officials who head departments of elementary and secondary education.
- National Governor's Association (NGA): the collective voice of the nation's governors and one of Washington, D.C.'s most respected public policy organizations.

THE BEGINNING - CALIFORNIA

- Each state could adopt the standards as is or they could add up to 15% more.
- CA added more by including some current 1997 standards, adding an Algebra 1 option in grade 8, and adding Statistics AP and Calculus in high school. Those standards are bold and underlined.
- The standards were adopted in CA on August 2, 2010.

BILL McCALLUM & JASON ZIMBA VIDEO, 8 MINUTES

The Mathematics Standards: How They Were Developed and Who Was Involved - YouTube
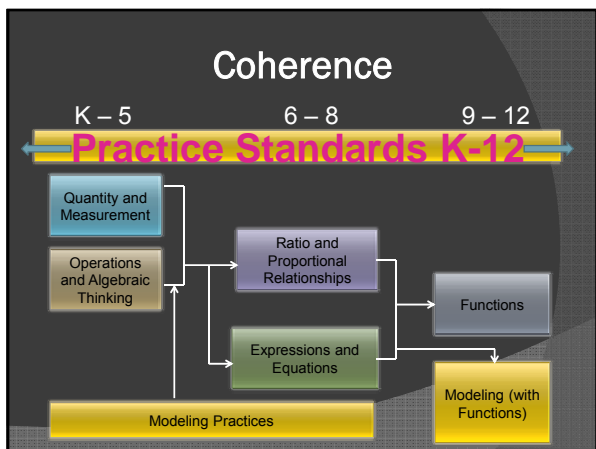
THE SHIFTS FOR MATHEMATICS

⊙ **Focus**

⊙ **Coherence**

⊙ **Rigor**

Focus

Eraser Power–
Teach Less
Learn More

Coherence

K – 5	6 – 8	9 – 12

Practice Standards K-12

Quantity and Measurement

Operations and Algebraic Thinking

Ratio and Proportional Relationships

Functions

Expressions and Equations

Modeling (with Functions)

Modeling Practices

Rigor

Conceptual Understanding

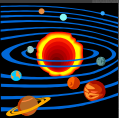**Procedural Skill and Fluency**

Application

Conceptual Understanding

Understanding the Mathematics vs. Answer-Getting
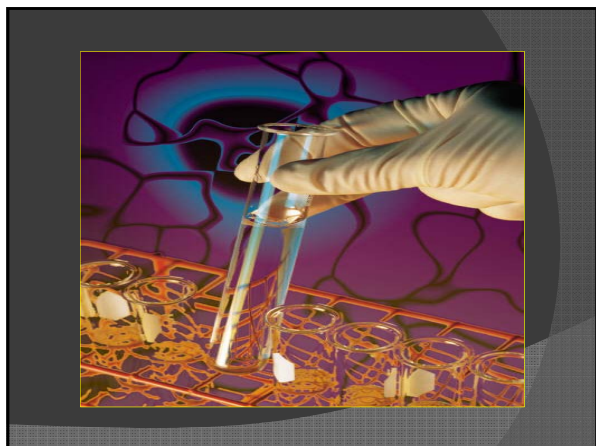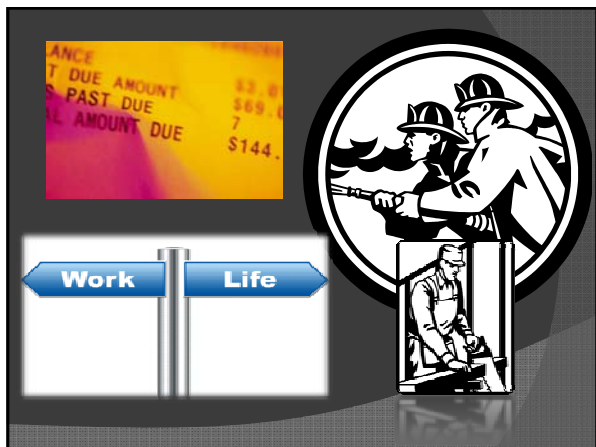
Procedural Skill and Fluency

Application

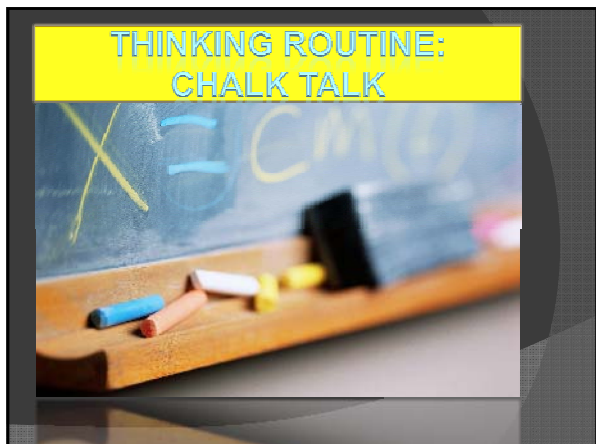Knowing how to connect math to life…

PHIL DARO VIDEO
16 MINUTES

Phil Daro - The Formative Principles of the
Common Core Standards on Vimeo

THINKING ROUTINE: CHALK TALK

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◉ All participants stand around a large sheet of paper. One person writes a word, phrase or question on the paper and places colored markers nearby.

◉ Participants randomly add their impressions to the phrase or add comments/questions to the ideas written by others. **No one speaks for several minutes as the process continues.** The result should resemble a web, and there will be diverse responses.

◉ What ideas come to mind when you consider this idea? What connections can you make to others' responses? (Lines) What questions arise as you think about the ideas and consider the responses and comments of others? (Question marks, underline or star)

Thinking moves: generate ideas, connect responses, and consider other viewpoints, compare and contrast

THE STANDARDS – CA 1997

◉ The 1997 CA standards are organized by grade level for K – 7 and are presented in the same five strands.
  • Number Sense
  • Algebra & Functions
  • Measurement & Geometry
  • Statistics, Data Analysis, and Probability
  • Mathematical Reasoning
◉ The grade 8 – 12 standards are presented under discipline headings instead of grade levels.

THE STANDARDS – CCSS-M for CA

- The CCSS are organized by grade level for K – 8 and are presented in different domains. The high school standards are currently listed in conceptual categories.
- The 8 Standards for Mathematical Practice are the same K – 12.
- CA Algebra 1 for grade 8 is currently under review. Will most likely align with the high school equivalent.

THE STANDARDS – CCSS-M for CA

K – 5 Domains

K	1	2	3	4	5
Counting and Cardinality (CC)					
Numbers and Operations in Base Ten (NBT)					
			Number and Operations – Fractions (NF)		
Operations and Algebraic Thinking (OA)					
Measurement and Data (MD)					
Geometry (G)					

THE STANDARDS – CCSS-M for CA

6 – 8 Domains

6	7	8
Ratios and Proportional Relationships (RP)		
The Number System (NS)		
Expressions and Equations (EE)		
		Functions (F)
Geometry (G)		
Statistics and Probability (SP)		

THE STANDARDS – CCSS-M for CA

Conceptual Categories

High School
Number and Quantity (N)
Algebra (A)
Functions (F)
Modeling
Geometry (G)
Statistics and Probability (S)

SAMPLE OF COHERENCE

Focusing attention within Number and Operations

K – 5	6 – 8	High School
Operations and Algebraic Thinking	Expressions and Equations	Algebra
Number and Operations – Base Ten	The Number System	
Number and Operations – Fractions		

THINKING ROUTINE: COMPASS POINTS

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- Draw a compass in the center of your paper and then record responses that correspond to the appropriate direction: **E, W, N, or S.** You will fill out the compass as we go through this section on assessments.

- **E = Excited** What excites you about the new assessments? What's the upside?

- **W = Worrisome** What do you find worrisome about the new assessments? What's the downside?

- **N = Need to Know** What else do you need to know or find out about the new assessments?

- **S = Stance or Suggestion for Moving Forward** What is your current stance or opinion on the new assessments? How might you move forward in preparing for the new assessments?

Thinking moves: flesh out an idea or proposition and eventually evaluate it

THE ASSESSMENT

- Smarter Balanced Assessment Consortium (SBAC)
  - CA is a governing state
- Testing begins in 2014 – 2015
- Summative test in grades 3 – 8, and 11
- CA may add grades 2, 9 and 10

SMARTER BALANCED
Green – governing states, Blue – participating states

SELECTED RESPONSE

Traditionally, selected-response (SR) items include a stimulus and stem followed by three to five options from which a student is directed to choose only one answer. By redesigning some SR items, it is often possible to both increase the complexity of the item and yield more useful information regarding the level of understanding about the subject(s) that a student's response demonstrates.

SELECTED RESPONSE – GRADE 3

The number sentence below can be solved using tens and ones.

67 + 25 = _____ tens and _____ ones

Select one number from each column to make the number sentence true.

Tens	Ones
○ 2	○ 2
○ 6	○ 5
○ 8	○ 10
○ 9	○ 12

SELECTED RESPONSE – GRADE 6

Identify the number(s) that makes each statement true. You may select more than one number for each statement.

1a. $-4.8 + \square$ = a positive number   ○ −5.2   ○ 4.9

1b. $\square - 1\frac{1}{2}$ = a negative number   ○ $\frac{3}{2}$ ○ $-\frac{7}{3}$

1c. $\square + 5$ = zero   ○ −5   ○ 5

1d. $-2.15 - \square$ = a negative number   ○ −1.75   ○ 1.34

1/29/2013

SELECTED RESPONSE – ALGEBRA

Given: $(x + 4)^2 - (x - 2)(x + 4)$

For numbers 1a - 1f, determine whether the expressions are equivalent to the expression given above, for all values of x.

1a.	24	○Yes	○No
1b.	$2(x + 4)$	○Yes	○No
1c.	$-2(x - 12)$	○Yes	○No
1d.	$6(x + 4)$	○Yes	○No
1e.	$(x + 4) - (x - 2)$	○Yes	○No
1f.	$(x + 4)[(x + 4) - (x - 2)]$	○Yes	○No

CONSTRUCTED RESPONSE

The main purpose of a constructed-response (CR) item/task is to address targets that are of greater complexity, requiring more analytical thinking and reasoning than an SR item can typically elicit.

Out of necessity, only the CRs that can be computer scored using current technologies will be assigned to the computer-adaptive component of the assessment. All other CRs will be assigned to a collection of 6 to 9 tasks that are intended to collectively take up to 120 minutes to administer.

CONSTRUCTED RESPONSE – GRADE 4

A scientist watched a group of squirrels collect acorns. Each squirrel **ate** some of the collected acorns and **stored** the rest of the collected acorns.

The table below shows data for three squirrels in the group. The number of acorns each squirrel **stored** is missing from the table. Fill in the data that are missing from the table.

Acorns Collected by Squirrels

Squirrel	Number Eaten	Number Stored	Total Number Collected
x	40		100
y	50		105
z	35		95

CONSTRUCTED RESPONSE – GRADE 7

In the following equation, a and b are both integers.

$$a(3x - 8) = b - 18x$$

What is the value of a?

What is the value of b?

CONSTRUCTED RESPONSE – ALGEBRA

A restaurant serves a vegetarian and a chicken lunch special each day. Each vegetarian special is the same price. Each chicken special is the same price. However, the price of the vegetarian special is different from the price of the chicken special.

- On Thursday, the restaurant collected $467 selling 21 vegetarian specials and 40 chicken specials.
- On Friday, the restaurant collected $484 selling 28 vegetarian specials and 36 chicken specials.

What is the cost of each lunch special?
Vegetarian: _____
Chicken: _____

EXTENDED RESPONSE

In order to distinguish the CR items/tasks that contribute to the performance task component from those that are part of the computer-adaptive component, the former will be referred to as extended-response (ER) items/tasks.

It is intended that no single ER be administered in isolation, but rather as part of a collection of 6 to 9 ER items/tasks that will serve to complete the distribution of content and targets for a well-designed assessment, appropriate to each grade.

EXTENDED RESPONSE – GRADE 5

Mrs. Phelps bought 4 boxes of crayons at the store to share with her students. Each box contained a total of 64 crayons.

Part A What is the total number of crayons Mrs. Phelps bought at the store? Explain your answer using diagrams, pictures, mathematical expressions and/or words.

[ ] Crayons

Part B Mrs. Phelps wants to give each of her students an equal number of the crayons she bought. There are 32 students in Mrs. Phelps' class. How many crayons should each student get?

[ ] Crayons

Part C How many more boxes of crayons does Mrs. Phelps need if she wants each of her students to get 12 crayons? Explain your answer using diagrams, pictures, mathematical expressions and/or words.

[ ] Boxes of Crayons

EXTENDED RESPONSE – GRADE 8

Ashley and Brandon have different methods for finding square roots.

Ashley's Method
To find the square root of x, find a number so that the product of the number and itself is x. For example, $2 \cdot 2 = 4$, so the square root of 4 is 2.

Brandon's Method
To find the square root of x, multiply x by $\frac{1}{2}$. For example, $4 \cdot \frac{1}{2} = 2$, so the square root of 4 is 2.

Which student's method is **not** correct?
   Ashley's method
   Brandon's method

Explain why the method you selected is **not** correct.

EXTENDED RESPONSE – FUNCTIONS

Part A
The rectangle shown at right has a length of 6 feet.

6 feet
[ ]

The value of the area of the rectangle, in square feet, is an irrational number. Therefore, the number that represents the width of the rectangle must be —

A. A whole number
B. A rational number
C. An irrational number
D. A non-real complex number

Part B
The length, l, and width, w, of the rectangle shown at right have values that are rational numbers.

l feet
w feet
[ ]

Construct an informal proof that shows that the value of the area, in square feet, of the rectangle must be a rational number.

COMPLETE YOUR COMPASS POINTS.

Communication
Communication

- Teacher leaders are a critical component of the flow of transition information to your colleagues at your site.
- They will be sharing with you information from the professional development they receive.

Main Purposes of the Teacher Leader in Mathematics

- LEARN

- SHARE

- SHAPE

LEARN

- Teacher leaders will learn about the CCSS-M and how their implementation will proceed.

SHARE

- Teacher leaders will share what they learn with their staff/department

- Teacher leaders will share their staff's/ department's thoughts with us in January, 2013

SHAPE

Teacher leaders will help you shape the implementation process for VUSD kids.

THANK YOU

WEBSITES:

◉ Smarter Balanced Assessment Consortium: www.smarterbalanced.org
◉ California Common Core State Standards & resources: www.cde.ca.gov/ci/cc

VUSD CONTACTS

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