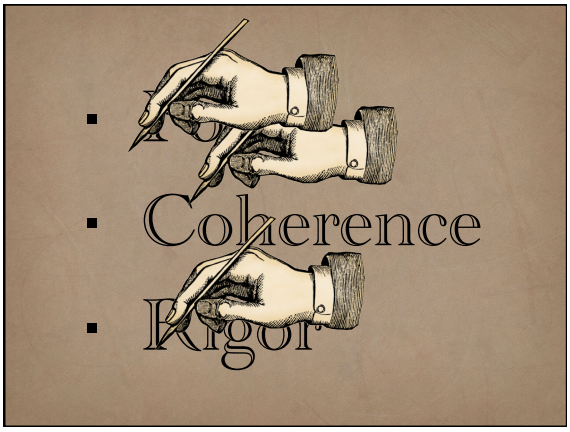
Magnolia Science Academy 8 - Bell

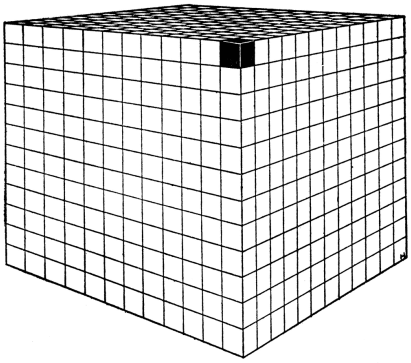
Robert Kaplinsky

May 31, 2013

Content Standards

- 6.G.2 - Find the volume of a right rectangular prism with fractional edge lengths
- 7.G.6 - Solve real-world and mathematical problems involving area, volume and surface area

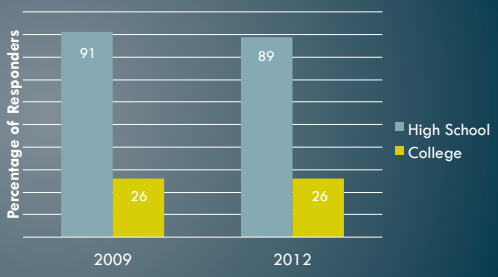




WHY DO WE NEED THE COMMON CORE STANDARDS?

- *What is the purpose of K-12 Ed?*
  - *College readiness*
    - *ACT National Curriculum Survey*
    - *Surveyed 9,937 educators.*

"Well" or "Very Well" Prepared for College



Source: http://www.act.org/research/policymakers/pdf/NCS-PolicySummary2012.pdf

WHY DO WE NEED THE COMMON CORE STANDARDS?

- *What is the purpose of K-12 Ed?*
  - *College readiness*
  - *Career readiness*
    - *Association of American Colleges and Universities survey*
    - *Survey over 300 employers with at least 25 employees and many new hires.*

How Is It All Connected?

College Readiness ⇒ Standards for Mathematical Practice and Content

Career Readiness ⇒ Standards for Mathematical Practice and Content

Content Standards

- 8.F.4 - Construct a function to model a linear relationship between two quantities.

Standards for Mathematical Practice

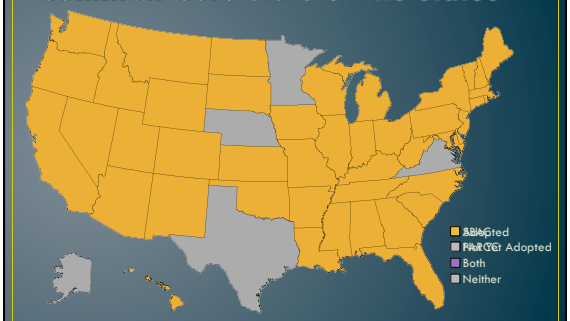
1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

How Is It All Connected?

College Readiness ⇒ Standards for Mathematical Practice and Content ⇒ Standardized Assessment

Career Readiness ⇒ Standards for Mathematical Practice and Content ⇒ Standardized Assessment

Common Core State of the States



- Sources: corestandards.org (as of May 2013)

SMARTER BALANCED ASSESSMENT

- Students in grades 3 through 8 and grade 11 will be assessed.
- Computer adaptive
- Both electronic and human scoring.
- Interim assessments
- Practice tests just released on May 29th.

SMARTER BALANCED PROBLEM TYPES

- *Selected-response items*
  - *Prompt students to select one or more responses from a set of options.*

Source: http://sampleitems.smarterbalanced.org/itempreview/sbac/

Look at each expression. Is it equivalent to $\frac{x+3y}{2}$?
Select Yes or No for expressions A – D.

A. $4x + 3y$ ○ Yes ○ No

Score Result

Your response earned 1 points of a possible 1

All credit answer	Your answer
The student correctly classified each expression.	✔

Ok

C. $\frac{2}{3}(x+3y)$ ○ Yes ○ No

D. $\frac{2}{3}\left(\frac{5x}{6}+\frac{9y}{4}-\frac{x}{12}\right)$ ● Yes ○ No

For each linear equation in the table, select whether the equation has no solution, one solution, or infinitely many solutions.

Score Result

Your response earned 0 points of a possible 1

All credit answer	Your answer
The student correctly identified the number of solutions for each equation.	✖

Ok

$-12(x + 2) = -14x + 2$	✔		

SMARTER BALANCED PROBLEM TYPES

- *Selected-response items*
- *Technology-enhanced items*
  - *Use technology to collect evidence through a non-traditional response type, such as editing text or drawing an object.*

Source: http://sampleitems.smarterbalanced.org/itempreview/sbac/

The point on the number line shows the location of $-3\frac{1}{2}$

Score Result

Your response earned 2 points of a possible 2

All credit answer	Your answer
The student correctly identified the location of -3 1/2 plus (-5).	✔
The student correctly identified the location of -3 1/2 - 3 1/2.	✔
The student correctly identified the location of -3 1/2 plus 3 1/2.	✔
The student correctly identified the location of -3 1/2 - (-5).	✔

Ok

$-3\frac{1}{2}+3\frac{1}{2}$ $-3\frac{1}{2}+(-5)$

Two water tanks are shown. Tank A is a rectangular prism and Tank B is a cylinder. The tanks are not drawn to scale.

Score Result

Your response earned 1 points of a

All credit answer	Your answer
The student used the relationship between the volumes to calculate the radius of the base of the cylinder.	✔

Ok

Drag one number into the box to show the approximate radius of the base of Tank B.

0 1 2 3 4 5 6 7 8 9

SMARTER BALANCED PROBLEM TYPES

- *Selected-response items*
- *Technology-enhanced items*
- *Constructed-response items*
  - *Students produce a text and/or numerical response in order to collect evidence about their knowledge or understanding.*

Source: http://sampleitems.smarterbalanced.org/itempreview/sbac/

For full credit (2 points):
- Student reaches the correct conclusion.

AND
- Student provides sufficient reasoning to support this conclusion.

For partial credit (1 point):
- Student reaches the correct conclusion but does not provide sufficient reasoning to support this conclusion.

OR
- Student does not reach the correct conclusion but provides reasoning to support this conclusion that contains a minor conceptual or computation error.

For full credit (2 points):
- Student reaches the correct conclusion.

AND
- Student provides sufficient reasoning to support this conclusion.

For partial credit (1 point):
- Student reaches the correct conclusion but does not provide sufficient reasoning to support this conclusion.

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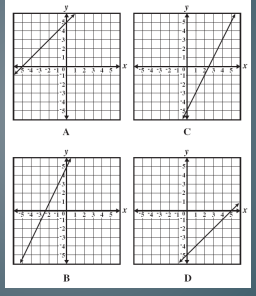
SMARTER BALANCED PROBLEM TYPES

- *Selected-response items*
- *Technology-enhanced items*
- *Constructed-response items*
- *Performance tasks*
  - *Measure a student's ability to integrate knowledge and skills across multiple standards.*

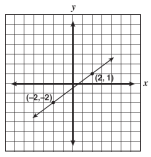
Source: http://sampleitems.smarterbalanced.org/itempreview/sbac/

Common Core vs. California Standards

51 Which *best* represents the graph of $y = 2x - 5$?



52 What is the slope of this line?



A $\frac{1}{2}$

B $\frac{3}{4}$

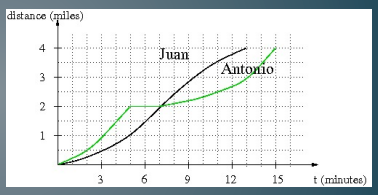
C 1

D $\frac{4}{3}$

Source: http://www.cde.ca.gov/Ta/tg/sr/documents/cstrtqmath7.pdf

Common Core vs. California Standards

- Antonio and Juan are in a 4-mile bike race. The graph below shows the distance of each racer (in miles) as a function of time (in minutes).



- Who wins the race? How do you know?
- Imagine you were watching the race and had to announce it over the radio, write a little story describing the race.

Source: http://www.illustrativemathematics.org/standards/k8

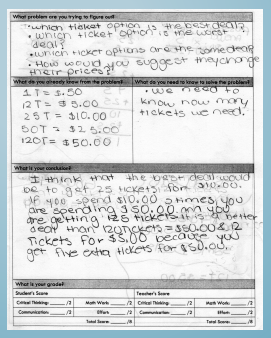
Content Standards

- 6.RP.2 – Understand the concept of a unit
- 6.RP.3 – Use ratio and rate reasoning to solve real-world and mathematical problems.

The Reality

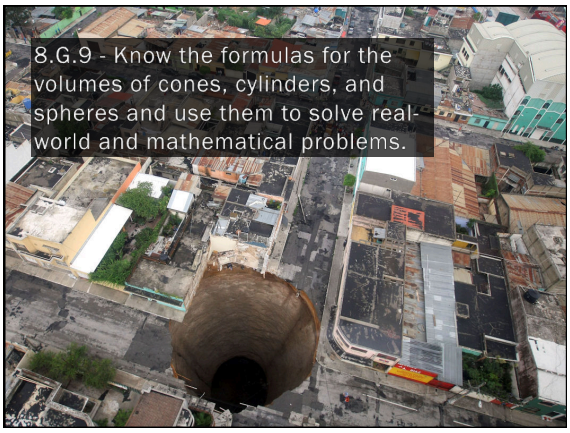
- What does "best" mean?
  - 120 tickets for $50 is "best" because you get the most tickets
  - 1 ticket for $0.50 is "best" because you spend the least amount of money
- "What do you need to know to solve the problem?"
  - How many tickets will we use?
  - How long will we be staying there?
  - How many people are we going with?
  - How many tickets do the rides cost?
- Once they started working, they had no idea what to do.
  - They didn't realize that they could buy multiple sets of tickets.

STUDENT WORK SAMPLES



The Four C's

- Communication
- Curiosity



The Four C's

- Communication
- Curiosity
- Critical Thinking
- Content Knowledge

Questioning Scenarios

- The activity begins with teachers in groups of three taking the roles of teacher, student, or observer.
- The individuals playing the role of teacher and student each receive a slip of paper describing their scenario.
- The individual playing the role of observer waits to record all of the teacher's questions to the student.
- Once the activity begins, the teacher will talk to the student in the context of the scenario they read about on the slips of paper.

What did you get for the area of the circle with a radius of 2 units?

4 pi

Great. Do you have any questions?

No

What did you get for the area of the circle with a radius of 2 units?

4 pi

Great. How did you get your answer?

The radius is 2 so I plugged it into 2 pi r and got 4 pi.

BREAKING DOWN THE CONTENT STANDARDS

- Domain and Conceptual Categories

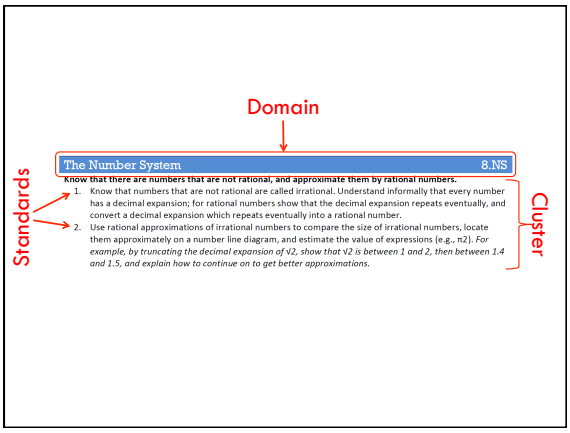
Domain and Conceptual Categories

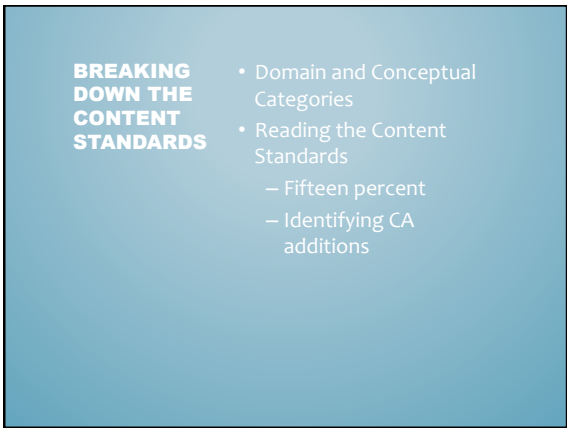
K	1	2	3	4	5	6	7	8	HS
Counting & Cardinality									
Number and Operations in Base Ten						Ratios and Proportional Relationships			Number and Quantity
			Number and Operations – Fractions			The Number System			
Operations and Algebraic Thinking						Expressions and Equations			Algebra
								Functions	Functions
Geometry									Geometry
Measurement and Data						Statistics and Probability			Statistics & Probability

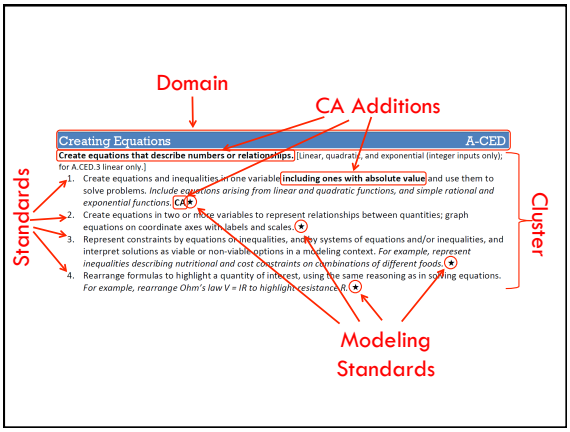
Source: http://www.doe.in.gov/achievement/curriculum/resources-implementing-indianas-common-core-standards

BREAKING DOWN THE CONTENT STANDARDS

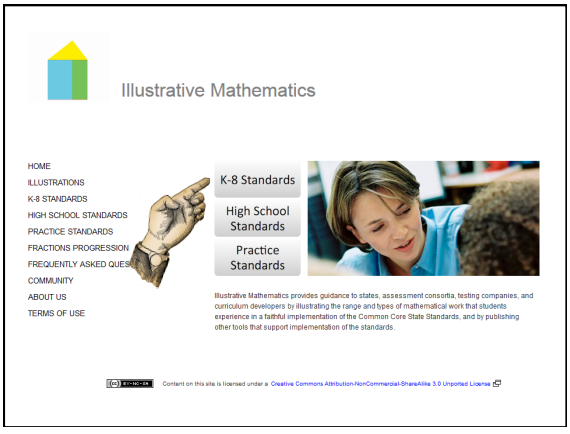
- Domain and Conceptual Categories
- Reading the Content Standards


Domain
Standards
The Number System 8.NS
Know that there are numbers that are not rational, and approximate them by rational numbers.
1. Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
2. Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π2). For example, by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.
Cluster


BREAKING DOWN THE CONTENT STANDARDS
• Domain and Conceptual Categories
• Reading the Content Standards
– Fifteen percent
– Identifying CA additions


Domain
CA Additions
Standards
Creating Equations A-CED
Create equations that describe numbers or relationships. [Linear, quadratic, and exponential (integer inputs only); for A.CED.3 linear only.]
1. Create equations and inequalities in one variable including ones with absolute value and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. CA ★
2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. ★
3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods. ★
4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R. ★
Cluster
Modeling Standards


BREAKING DOWN THE CONTENT STANDARDS
• Domain and Conceptual Categories
• Reading the Content Standards
– Fifteen percent
– Identifying CA additions
• Understanding the standards


Illustrative Mathematics
HOME
ILLUSTRATIONS
K-8 STANDARDS
HIGH SCHOOL STANDARDS
PRACTICE STANDARDS
FRACTIONS PROGRESSION
FREQUENTLY ASKED QUES
COMMUNITY
ABOUT US
TERMS OF USE
K-8 Standards
High School Standards
Practice Standards
Illustrative Mathematics provides guidance to states, assessment consortia, testing companies, and curriculum developers by illustrating the range and types of mathematical work that students experience in a faithful implementation of the Common Core State Standards, and by publishing other tools that support implementation of the standards.
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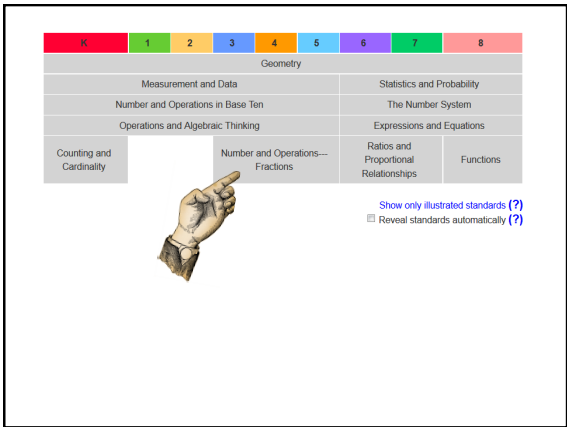
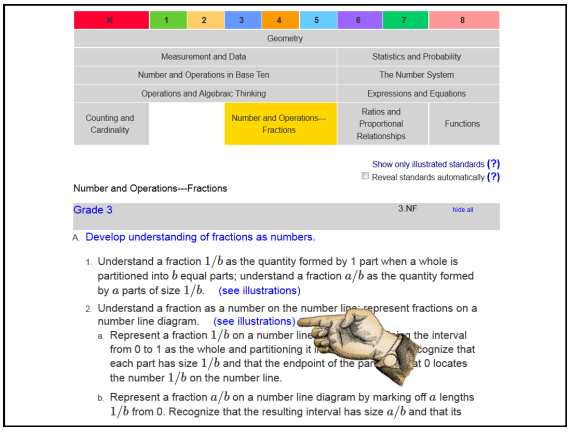
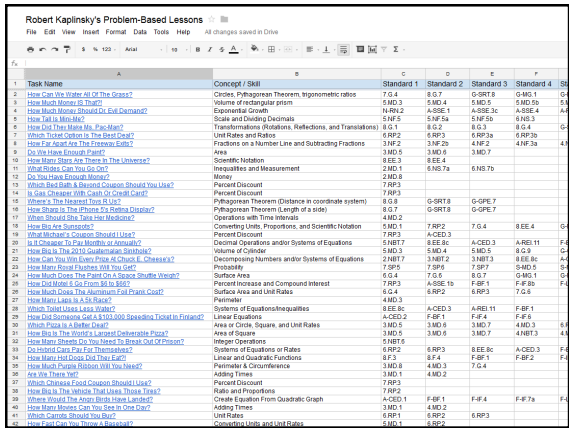

K 1 2 3 4 5 6 7 8
Geometry
Measurement and Data
Statistics and Probability
Number and Operations in Base Ten
The Number System
Operations and Algebraic Thinking
Expressions and Equations
Counting and Cardinality
Number and Operations---Fractions
Ratios and Proportional Relationships
Functions
Show only illustrated standards (?)
Reveal standards automatically (?)


K 1 2 3 4 5 6 7 8
Geometry
Measurement and Data
Statistics and Probability
Number and Operations in Base Ten
The Number System
Operations and Algebraic Thinking
Expressions and Equations
Counting and Cardinality
Number and Operations—Fractions
Ratios and Proportional Relationships
Functions
Show only illustrated standards (?)
Reveal standards automatically (?)
Number and Operations---Fractions
Grade 3
3.NF
hide all
A. Develop understanding of fractions as numbers.
1. Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$. (see illustrations)
2. Understand a fraction as a number on the number line; represent fractions on a number line diagram. (see illustrations)
a. Represent a fraction $1/b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line.
b. Represent a fraction a/b on a number line diagram by marking off a lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its


Content Standards Review
• Read your course standards
• Introduction
• Overview
• Course differences
• Reference standards on illustrativemathematics.org
• Review standards for one or more grade levels above and below


Robert KAPLINSKY
Glenrock Consulting
Home Lessons Blog Speaking & Writing Services Beliefs About Contact
How Many Sheets Do You Need To Break Out Of Prison?
Operations with rational numbers
CRIME SCENE DO NOT ENTER
Why Choose Us?
Math content expert
Lessons
How Can We Water All Of The Grass?
How Much Money IS That?!


Robert Kaplinsky's Problem-Based Lessons
Task Name
Concept / Skill
Standard 1
Standard 2
Standard 3
Standard 4


NEXT STEPS
• Standards for Mathematical Practice
– Talking and writing about mathematics
• Rigor
– Application
– Conceptual understanding
– Procedural skill and fluency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