

What Friends of Teachers Should Know About The Common Core State Standards for Mathematics

Cody L. Patterson
The University of Arizona

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Gathering Your Thoughts

Please think about the following questions:

- 1 What do you know about the Common Core State Standards for Mathematics (CCSSM)?
- 2 How does your **mentor teacher** feel about the Common Core?

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Please discuss your answers to these questions at your table.

My Background

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What I don't have to do with the Common Core:

- Teaching K-12 students

Teacher Feedback on the CCSSM

Some teacher feelings about the CCSSM:

- Upset
- Worried
- Overwhelmed
- Hopeful
- Excited

What Is the Common Core?

The **Common Core State Standards** are a set of academic expectations for students in Grades K-12, developed by a consortium of 48 states.

The Common Core contains standards for both Mathematics and English Language Arts.

The standards were adopted by 45 states. Most states are in the process of implementing the standards now and will be implementing assessments aligned to the CCSS in 2014-15.

What Is the Common Core?

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Counting and Cardinality								
Operations and Algebraic Thinking						Expressions and Equations		
						Ratios and Proportional Relationships	Functions	
Number and Operations in Base Ten						The Number System		
			Number and Operations - Fractions					
Measurement and Data						Statistics and Probability		
Geometry						Geometry		

High School Conceptual Categories

High School
Algebra
Functions
Number and Quantity
Statistics and Probability
Geometry
Modeling

What Is the Common Core?

Some Sample Standards

3.NF.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 $1/b$.

3.NF.2. Understand a fraction as a number on the number line; represent fractions on a number line diagram.

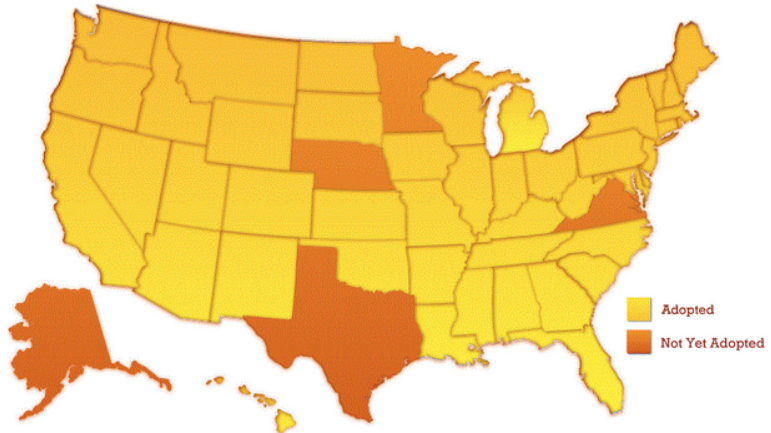
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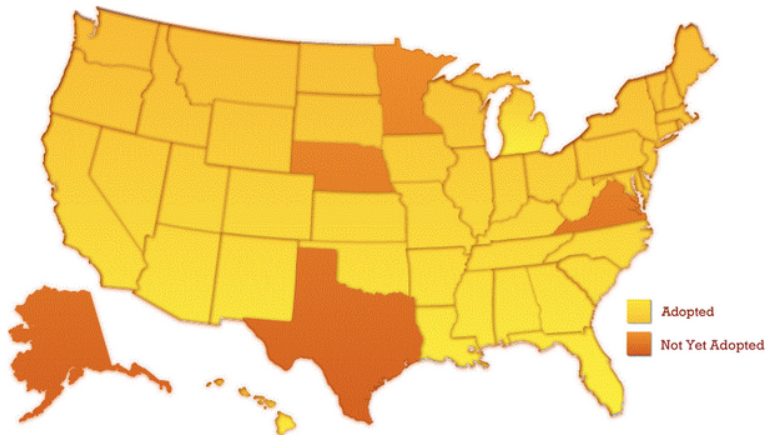
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A Nationwide Effort to Improve Education



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Implications for: instruction, curriculum, professional development, assessment, policy, . . .

Why Are We Doing This?

A Fundamental Disconnect

Solving Quadratic Equations: Completing the Square

Solve for the unknown variable. Complete the square where needed.

1) $x^2 + 6x = 16$

6) $x^2 + 2x = 3$

2) $x^2 - 10x - 39 = 0$

7) $x^2 + 6x + 8 = 0$

from [EdBoost.org](https://www.edboost.org)

Why Are We Doing This?

A problem from a college algebra class:

A ball is thrown upward. The ball's height (in feet) t seconds after it is thrown is given by the function $h(t) = 4 + 24t - 16t^2$.

What is the maximum height attained by the ball?

Why Are We Doing This?

A problem from a calculus class:

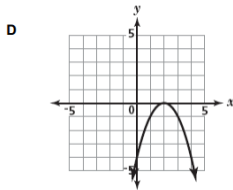
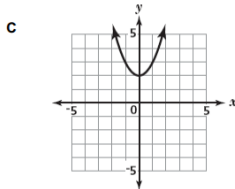
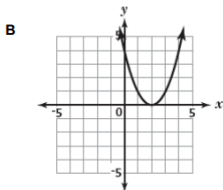
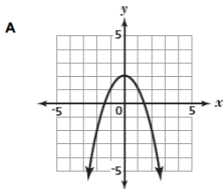
Evaluate the indefinite integral

$$\int \frac{dx}{x^2 + 6x + 10}.$$

Why Are We Doing This?

25 What is the graph of the equation?

$$y = x^2 - 4x + 4$$



Source: AIMS Released Sample Items, www.azed.gov

Why Are We Doing This?

We need standards that better link the **machinery** of algebra – skills and procedures – to the **meanings** of algebraic concepts, and to possible **uses** of these skills.

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A-SSE.3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

A-SSE.3.b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.

A Math Problem

As a group, solve the equation

$$x^2 = (2x - 9)^2$$

using as many different methods as you can. Justify each solution approach, as you might to a student unfamiliar with the method you are using.

Record these methods on a sheet of paper (one for each group), and number each method.

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As you do this, take mental note of the mathematical skills and competencies you are drawing upon.

Sharing of Solution Methods

Standards for Mathematical Practice

The Common Core 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 generality in repeated reasoning.

The Algebra Standards

Question

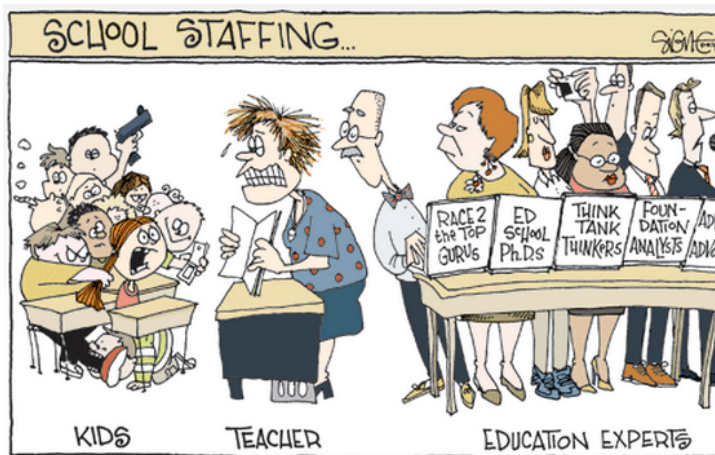
Why might teachers find it difficult to teach to a set of standards like the Common Core high school Algebra standards?

Some Dos and Don'ts

Some Common Core Dos and Don'ts for Friends of Teachers

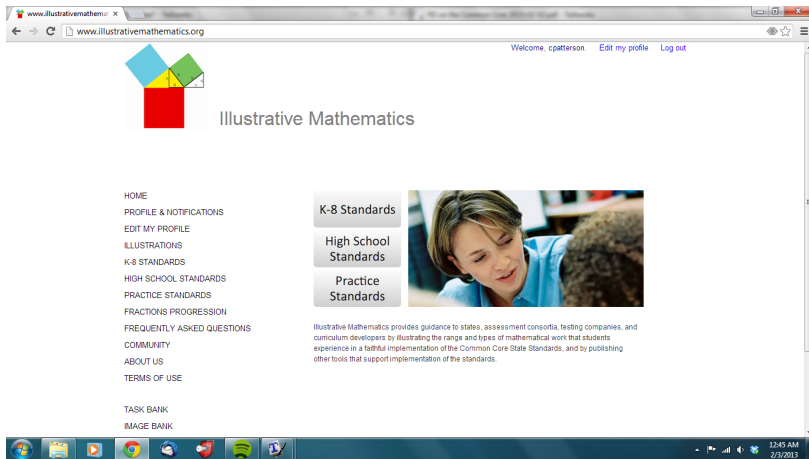
Some Dos and Don'ts

Don't try to persuade teachers that they should be happy/optimistic about the Common Core



Some Dos and Don'ts

Do what you can (within your role as a “teacher helper”) to introduce activities and tasks that are mathematically rich and CCSSM-aligned



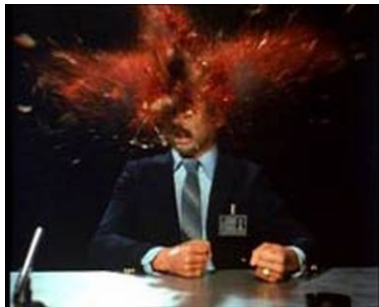
The screenshot shows a web browser window with the address bar displaying www.illustrativemathematics.org. The website features a logo on the left consisting of four colored squares (blue, yellow, green, red) arranged in a larger square. To the right of the logo, the text "Illustrative Mathematics" is displayed. In the top right corner, there is a navigation bar with the text "Welcome, cpatterson." followed by links for "Edit my profile" and "Log out".

The main content area is divided into two columns. The left column contains a vertical list of links: HOME, PROFILE & NOTIFICATIONS, EDIT MY PROFILE, ILLUSTRATIONS, K-8 STANDARDS, HIGH SCHOOL STANDARDS, PRACTICE STANDARDS, FRACTIONS PROGRESSION, FREQUENTLY ASKED QUESTIONS, COMMUNITY, ABOUT US, TERMS OF USE, TASK BANK, and IMAGE BANK. The right column features three buttons: "K-8 Standards", "High School Standards", and "Practice Standards". To the right of these buttons is a photograph of a young boy with short brown hair, wearing a blue shirt, looking down at something in his hands. Below the photograph, there is a paragraph of text: "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."

The bottom of the screenshot shows a Windows taskbar with various application icons and a system clock in the bottom right corner displaying "12:45 AM 2/3/2013".

Some Dos and Don'ts

Don't introduce all of the complexity of the Common Core all at once



Some Dos and Don'ts

Do look for opportunities to ratchet up the level of discourse and reasoning in your math class

- Contextualize problems
- Pose problems in which there is more than one possible solution method, and ask students to justify their choice of method
- Ask “Why?”, “When does ...?”, and “What if ...?”

Some Dos and Don'ts

Don't expect every standard to be mastered in a day

Today, SWBAT make sense of problems and persevere in solving them.

Some Dos and Don'ts

Do try to integrate standards that are far-reaching into the everyday business of math class

Example: How could I weave the following standard into a lesson on exponential functions?

F-IF.4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.

Some Dos and Don'ts

Do have fun. Know that you are making a difference.

Thank you for supporting mathematics (and science, and other) teachers!

Questions

Please use one of the green index cards at your table to write down any questions (or thoughts, or concerns) you have about the Common Core.