Why does the U.S. need this?

PISA 2009

Overall Math Scale

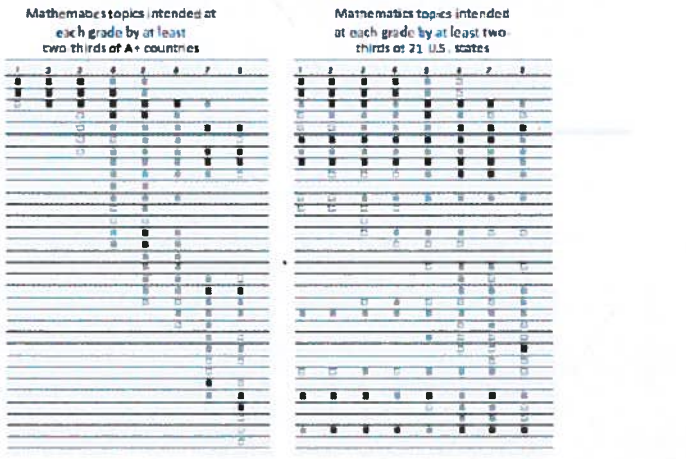
Significantly Above OECD Average
Not Significantly Different (OECD Average 496)
Significantly below OECD Average

Leadership in Education

1	Shanghai-China	600
2	Singapore	562
3	Hong Kong-China	555
4	Korea	546
6	Finland	541
9	Japan	529
10	Canada	527
11	Netherlands	526
13	New Zealand	519
15	Australia	514
16	Germany	513
22	France	497
28	United Kingdom	492
31	United States	487
32	Ireland	487
34	Spain	483
38	Russian Federation	468
51	Mexico	419
57	Brazil	386

How Does U.S. Curriculum Compare?

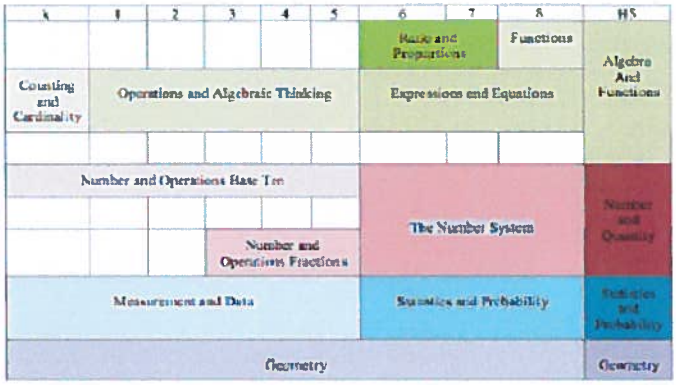
The shape of math in A+ countries



Schmidt, Houang, & Cogan, "A Coherent Curriculum: The Case of

New Focus with Common Core

A Schematic representation of CCSSM content



Smarter Balanced

What is CCSM all about?

College & Career Readiness

- ✓ "80% of math learned in K-12 can be done by a computer."
- ✓ While 89% of High School teachers report their students are prepared for College Level Math, only 26% of College Professors feel the students really are prepared.

What are some big changes?

Math Practices

- ✓ Most useful to students in and after college
- ✓ Define the skills needed to succeed in the 21st Century workforce
- ✓ Define focus of learning in math from K-12

COMMON CORE MATH VIDEO

Dan Meyer: Math class needs a makeover

http://www.ted.com/talks/dan_meyer_math_curriculum_makeover.html?utm_source=email&source=email&utm_medium=social&utm_campaign=ios-share

Rigor of Content: Ex. K, 4, Alg I

- ✓ Kinder will now spend half the year on numbers 0-9, with a focus in the second half on place value, using numbers 11-19. (Current practice is 0-30)
- ✓ 4th grade Current standard: Write the fraction represented by a drawing of parts of a figure; represent a given fraction by using drawings; and relate a fraction to a simple decimal on a number line.
- ✓ CCSM Gr. 4 standard: Explain why a fraction *a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.*
- ✓ Math 8, with CCSSM, is a course with its own separate set of standards which is comprised of 50% of what is currently Algebra I.
- ✓ High School standards are now comprised of 6 domains, to be taught over 3 years. The "Algebra I" part of these standards is significantly more difficult and complex than current Algebra I.

Major Changes in Assessment

- ✓ Current CST is approximately 95% procedure-based
- ✓ CCSSM-assessment will be comprised of the following:

  40% Concepts & Procedures

  20% Problem Solving

  20% Communicating & Reasoning

  20% Data Analysis & Modeling

Selected Response

For numbers 1a-1d, state whether or not each figure has $\frac{2}{5}$ of its whole shaded.

1a. Ⓨ Yes Ⓝ No

1b. Ⓨ Yes Ⓝ No

1c. Ⓨ Yes Ⓝ No

1d. Ⓨ Yes Ⓝ No

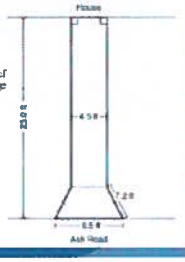
Constructed Response Example

CR 1: Ms. Olsen's Sidewalk

Ms. Olsen is having a new house built on Ash Road. She is designing a sidewalk from Ash Road to her front door. Ms. Olsen wants the sidewalk to have an end in the shape of an isosceles trapezoid, as shown.

The contractor charges a fee of $200 plus $12 per square foot of sidewalk listed on the diagram, what will the contractor charge Ms. Olsen for her sidewalk?

Show your work or explain how you found your answer.



Concepts & Procedures Ex.

42906

A. Drag into the box exactly three unique expressions whose sum is less than 10

B. Drag into the box exactly three unique expressions whose sum is between 10 and 20.

C. Drag into the box exactly three unique expressions whose sum is greater than 20.

$5\sqrt{7}$ $\sqrt{13}$ $\frac{3^4}{3^2}$ $20-\sqrt{20}$ $(4\cdot7)^{\frac{1}{2}}$ $8^{\frac{1}{3}}$

A. Three unique expressions whose sum is less than 10

B. Three unique expressions whose sum is between 10 and 20

C. Three unique expressions whose sum is greater than 20

Problem Solving Ex.

"Toys for Charity" - year 1 Algebra

Phil & Cathy want to raise money for charity. They decide to make and sell wooden toys. They could make them in two sizes: small & large.

Phil will carve them from wood. A small toy takes 2 hours to carve while a large toy takes 3 hours to carve.

Cathy will decorate them. She only has time to decorate 10 toys. The small toy will make $8 for charity. The large toy will make $10 for charity.

They want to make as much money for charity as they can. How many small and large toys should they make?
How much money will they make for charity?

Communicating & Reasoning Ex.

- Provide 3 examples to show how $a + b = b + a$

43058

The noise level at a music concert must be no more than 80 decibels (dB) at the edge of the property on which the concert is held

Melissa uses a decibel meter to test whether the noise level at the edge of the property is no more than 80 dB.

- Melissa is standing 10 feet away from the speakers and the noise level is 100 dB.
- The edge of the property is 70 feet away from the speakers
- Every time the distance between the speakers and Melissa doubles, the noise level decreases by about 6 dB.

Rafael claims that the noise level at the edge of the property is no more than 80 dB since the edge of the property is over 4 times the distance from where Melissa is standing. Explain whether Rafael is or is not correct.

Data Analysis Example

The "two-second rule" is used by a driver who wants to maintain a safe following distance at any speed. A driver must count two seconds from when the car in front of him or her passes a fixed point, such as a tree, until the driver passes the same fixed point. Drivers use the rule to determine the minimum distance to follow a car traveling at the same speed. A diagram representing this distance is shown.

As the speed of the cars increases, the minimum following distance also increases. Explain how the "two-second rule" leads to a greater minimum following distance as the speed of the cars increases. As part of your explanation, include the minimum following distance, in feet, for cars traveling at 30 miles per hour and 60 miles per hour.

Performance Task

- See Thermometer Crickets

Modeling Ex: Chick-Pea Problem

Question: How many peas does it take to fill your classroom?

What Challenges Will Teachers Face?

- Teachers need pedagogical content knowledge to learn how to teach conceptually to make content accessible to diverse learners.
- To prepare students for the varying depths of knowledge assessed, teachers need to learn how to teach without daily use of textbook and/or lecture.
- Teachers need to learn how to create experiences and structures for students to collaborate, problem solve and communicate their reasoning.
- Teachers need to understand the intentional vertical and cross-curricular connections in the math standards.