

The Common Core Math Standards: Excellence or Mediocrity?

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Who Wrote Them?

- Three main writers
 - **Bill McCallum, Mathematician, University of Arizona**
 - **Jason Zimba, Physicist, Bennington College, Vermont**
 - **Phil Daro, English Major, America's Choice (Marc Tucker organization)**
- Supporting Work Team composed of about 30 people of various background, which fed suggestions to the three main writers.
- A Feedback Team composed of about 20 mathematicians.

Feedback and suggestions were fed to the main writers mostly through the internet, and the decision what to include and what to ignore was left solely in their hands.

Proponents' Claims

- The standards are
 - **Focused, coherent, clear and rigorous**
 - **Internationally benchmarked**
 - **Anchored in college and career readiness**
 - **Evidence- and research-based**

(Sources: Achieve Inc., Common Core State Standards Initiative (CCSSI))
- With common standards and assessments, students, parents, and teachers will have a **clear, consistent understanding** of the skills necessary for students to succeed after high school and **compete with peers across the state line and across the ocean.**” *(Gov. Bob Wise, President, Alliance for Excellent Education)*
- And many more similar glowing statements from the **National PTA, NCTM, Council of Great City Schools, Thomas B. Fordham Foundation**, and the like, not to mention the Secretary of Education Arne Duncan and President Obama.

Clear and Rigorous?

- “I’ve been executive editor of *Education Next* for more than a decade. ... Over the years, we’ve done 40-odd forums, and have usually gotten our first-choice authors. When we haven’t gotten them, we’ve almost invariably gotten our second choice. All of which makes it astonishing that, over the past three months, **we’ve now asked six individuals involved in the Common Core math standards to pen a piece making the case for their rigor and quality, and each has declined in turn. This is, quite literally, unprecedented.**”
(*Rick Hess, American Enterprise Institute, Sep. 2011*)

Rigorous?

- "Despite these measures, there are still difficulties in reconciling many AP courses with the Common Core. In particular, **AP Calculus is in conflict with the Common Core**, Packer said, and **it lies outside the sequence of the Common Core because of the fear that it may unnecessarily rush students into advanced math classes** for which they are not prepared." (*Trevor Packer, Senior VP in charge of AP, College Board*)
- "[T]he **overall standards would not be too high, certainly not in comparison other nations**, including East Asia, where math education excels" (*Bill McCallum, Key Author of the Standards*)

Clearer?

Better Than California? (Table 1) *In the Common Core, clarity can be hard to come by.*

California State Standards

Common Core

Solve problems involving division of multi-digit numbers by one-digit numbers. (Grade 4)

Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. (Grade 4)

Estimate and compute the sum or difference of whole numbers and positive decimals to two places. (Grade 4)

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. (Grade 5)

Explain different interpretations of fractions, for example, parts of a whole, parts of a set, and division of whole numbers by whole numbers; explain equivalents of fractions. (Grade 4)

Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ 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. (Grade 4)

College and career ready?

- “[T]he concept of [Common Core’s] college readiness **is minimal and focuses on non-selective colleges**. (*Jason Zimba, Key Author of the Standards*)
- “Students who earn a College- and Career-Ready Determination in Mathematics will have demonstrated the academic knowledge, skills, and practices necessary to enter into and succeed in entry-level, credit-bearing courses in **College Algebra, Introductory Statistics** and technical subjects requiring an equivalent level of mathematics.” (*Laura Slover, Vice President, PARCC*)

College Algebra is also known on campus as “High School Algebra”

“College Algebra” = Algebra 2

“College Algebra” ≠ Calculus (needed for STEM!)

Internationally Benchmarked?

- Where originally the Common Core standards were claimed to be **benchmarked** to the best international standards, now they are merely supposed to be **informed** by them. *Whatever that means.*
- “The ... Common Core standard[s have] ... **significantly lower expectations** with respect to algebra and geometry than the published standards of other countries.” (*Jonathan Goodman, Professor of Mathematics, New York University.*)
- “[A] large number of the [Common Core] standards **are one, two or even more years behind** the corresponding standards for many if not all the high achieving countries.” (*Jim Milgram, Professor of Mathematics, Stanford; Member of the Common Core Validation Committee*)

Internationally Benchmarked?

(cont ...)

- **“We also used international benchmarking to judge the quality of the Common Core standards, and the results are surprising both for mathematics and for ELAR. Top-achieving countries for which we had content standards put a greater emphasis on “perform procedures” than do the U.S. Common Core standards. **High-performing countries’ emphasis on “perform procedures” runs counter to the widespread call in the United States for a greater emphasis on higher order cognitive demand.**”**
(Professor Andrew Porter, Dean, Graduate School of Education, University of Pennsylvania)

Evidence and Research Based?

- Prof. Bill Schmidt claims that based on his research:
 - Common Core's standards are very consistent with the standards in the world's top-achieving countries;
 - States with standards like the Common Core are the ones that did the best on the National Assessment of Educational Progress (NAEP);
 - The Common Core is "coherent" and "hierarchical," unlike many of the state standards it replaced.

**There is one problem with Schmidt's research:
It is sloppily done, and in any event Schmidt's own
data do not support his conclusions.**

Topic	Grade							
	1	2	3	4	5	6	7	8
Whole Number Meaning	●	●	●	●	●			
Whole Number Operations	●	●	●	●	●			
Measurement Units	●	●	●	●	●	●	●	
Fractions			●	●	●	●		
Equations & Formulas			●	●	●	●	●	●
Data Representation & Analysis			●	●	●	●	●	●
2-D Geometry Basics			●	●	●	●	●	●
Polygons & Circles			●	●	●	●	●	●
Perimeter, Area & Volume			●	●	●	●	●	●
Rounding & Significant Figures			●	●	●	●	●	●
Estimating Computations			●	●	●	●	●	●
Properties of Whole Numbers Operations			●	●	●	●	●	●
Estimating Quantity & Size			●	●	●	●	●	●
Decimals			●	●	●	●	●	●
Relation of Decimals & Fractions			●	●	●	●	●	●
Properties of Decimals & Fractions			●	●	●	●	●	●
Percentages					●	●	●	●
Proportionality Concepts					●	●	●	●
Proportionality Problems					●	●	●	●
2-D Coordinate Geometry					●	●	●	●
Geometric Transformations					●	●	●	●
Negative Numbers, Integers & Their Properties					●	●	●	●
Number Theory					●	●	●	●
Exponents, Roots & Radicals					●	●	●	●
Orders of Magnitude					●	●	●	●
Measurement Estimation & Errors					●	●	●	●
Constructions Using Straightedge & Compass					●	●	●	●
3-D Geometry					●	●	●	●
Congruence & Similarity								●
Rational Numbers & Their Properties								●
Functions								●
Slope								●

Intended by two-thirds or more of the top-achieving countries ●

TIMSS – Third International Math and Science Study, 1995. Later renamed to Trends in Math and Science Study.

TIMSS so-called “A+ countries” are six nations, Flemish Belgium, Czech Republic, Hong Kong, Japan, Korea, and Singapore, that scored at the top in the 1995 TIMSS.

Prof. Schmidt was the US TIMSS Coordinator at the time.

Fig.1: Mathematics topics intended at each grade by at least two thirds of the top-achieving (TIMSS A+) countries

Topic	Grade							
	1	2	3	4	5	6	7	8
Whole Number Meaning	●	●	●	●	●			
Whole Number Operations	●	●	●	●	●			
Measurement Units	●	●	●	●	●	●	●	
Fractions			●	●	●	●		
Equations & Formulas			●	●	●	●	●	●
Data Representation & Analysis			●	●	●	●	●	●
2-D Geometry Basics			●	●	●	●	●	●
Polygons & Circles			●	●	●	●	●	●
Perimeter, Area & Volume			●	●	●	●	●	●
Rounding & Significant Figures			●	●	●	●	●	●
Estimating Computations			●	●	●	●	●	●
Properties of Whole Numbers Operations			●	●	●	●	●	●
Estimating Quantity & Size			●	●	●	●	●	●
Decimals			●	●	●	●	●	●
Relation of Decimals & Fractions			●	●	●	●	●	●
Properties of Decimals & Fractions			●	●	●	●	●	●
Percentages			●	●	●	●	●	●
Proportionality Concepts			●	●	●	●	●	●
Proportionality Problems			●	●	●	●	●	●
2-D Coordinate Geometry			●	●	●	●	●	●
Geometric Transformations			●	●	●	●	●	●
Negative Numbers, Integers & Their Properties			●	●	●	●	●	●
Number Theory			●	●	●	●	●	●
Exponents, Roots & Radicals			●	●	●	●	●	●
Orders of Magnitude			●	●	●	●	●	●
Measurement Estimation & Errors			●	●	●	●	●	●
Constructions Using Straightedge & Compass			●	●	●	●	●	●
3-D Geometry			●	●	●	●	●	●
Congruence & Similarity			●	●	●	●	●	●
Rational Numbers & Their Properties			●	●	●	●	●	●
Functions			●	●	●	●	●	●
Slope			●	●	●	●	●	●

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Fig.1: Mathematics topics intended at each grade by at least two thirds of the top-achieving (TIMSS A+) countries

Topic	Grade							
	1	2	3	4	5	6	7	8
Whole Number Meaning	●	●	●	●	●			
Whole Number Operations	●	●	●	●	●			
Properties of Whole Numbers Operations	●	●	●	●	●	●	●	
Fractions	●	●	●	●	●	●	●	
Measurement Units	●	●	●	●	●	●	●	●
Polygons & Circles	●	●	●	●	●	●	●	●
Data Representation & Analysis	●	●	●	●	●	●	●	●
3-D Geometry	●	●	●	●	●	●	●	●
Measurement Estimation & Errors	●	●	●	●	●	●	●	●
Number Theory	●	●	●	●	●	●	●	●
2-D Geometry Basics	●	●	●	●	●	●	●	●
Rounding & Significant Figures	●	●	●	●	●	●	●	●
Relation of Decimals & Fractions	●	●	●	●	●	●	●	●
Estimating Computations	●	●	●	●	●	●	●	●
Perimeter, Area & Volume	●	●	●	●	●	●	●	●
Equations & Formulas	●	●	●	●	●	●	●	●
Decimals	●	●	●	●	●	●	●	●
Patterns, Relations & Functions	●	●	●	●	●	●	●	●
Geometric Transformations	●	●	●	●	●	●	●	●
Properties of Decimals & Fractions	●	●	●	●	●	●	●	●
Orders of Magnitude	●	●	●	●	●	●	●	●
2-D Coordinate Geometry	●	●	●	●	●	●	●	●
Exponents, Roots & Radicals	●	●	●	●	●	●	●	●
Percentages	●	●	●	●	●	●	●	●
Negative Numbers, Integers & Their Properties	●	●	●	●	●	●	●	●
Proportionality Concepts	●	●	●	●	●	●	●	●
Proportionality Problems	●	●	●	●	●	●	●	●
Rational Numbers & Their Properties	●	●	●	●	●	●	●	●
Constructions Using Straightedge & Compass	●	●	●	●	●	●	●	●
Systematic Counting	●	●	●	●	●	●	●	●
Uncertainty & Probability	●	●	●	●	●	●	●	●
Real Numbers & Their Properties	●	●	●	●	●	●	●	●
Congruence & Similarity	●	●	●	●	●	●	●	●
Slope	●	●	●	●	●	●	●	●
Validation & Justification	●	●	●	●	●	●	●	●

Fig.2: Mathematics topics intended in the Common Core State Standards

Schmidt & Houang claim that the figures are similar. Quote:

Results

Are the Common Core State Standards Coherent and Focused?

As Cobb and Jackson (2011) indicated, an important issue is whether the CCSSM are coherent and how they compare on this dimension to the 50 state standards that are either being replaced or are still in effect. Looking first at a visual representation, we note that Figure 2 representing the CCSSM bears a strong resemblance to Figure 1 (A+ model), at least in terms of its general shape. From that point of view, together with the vetting done by mathematicians (several of whom were the same ones that did the original vetting of the A+), it can be suggested that the CCSSM are coherent and focused.

W. H. Schmidt, R.T. Houang, **Curricular Coherence and the Common Core State Standards for Mathematics**, *Educational Researcher*, Nov. 2012.

But note that in figure 2, the rows WERE REORDERED to create the illusion of triangular “coherent” shape!

The row order in figure 2 has little rhyme or reason, except to create that “triangular illusion” that Schmidt wanted. For example:

- **“3D Geometry” in Common Core starts a grade before “2D Geometry Basics”**
- **“Relations of Decimals & Fractions” start a grade before “Decimals”**

Topic	Grade							
	1	2	3	4	5	6	7	8
Whole Number Meaning	•	•	•	•	•			
Whole Number Operations	•	•	•	•	•			
Properties of Whole Numbers Operations				•	•			
Fractions			•	•	•	•		
Measurement Units	•	•	•	•	•	•	•	
Polygons & Circles				•	•	•	•	•
Data Representation & Analysis			•	•	•	•		•
3-D Geometry							•	•
Measurement Estimation & Errors							•	
Number Theory							•	•
2-D Geometry Basics			•	•	•	•	•	•
Rounding & Significant Figures				•	•			
Relation of Decimals & Fractions				•	•	•		
Estimating Computations				•	•	•		
Perimeter, Area & Volume				•	•	•	•	•
Equations & Formulas			•	•	•	•	•	•
Decimals				•	•	•		
Patterns, Relations & Functions							•	•
Geometric Transformations						•	•	•
Properties of Decimals & Fractions					•	•		
Orders of Magnitude							•	•
2-D Coordinate Geometry					•	•	•	•
Exponents, Roots & Radicals							•	•
Percentages					•	•		
Negative Numbers, Integers & Their Properties					•	•	•	•
Proportionality Concepts					•	•	•	•
Proportionality Problems					•	•	•	•
Rational Numbers & Their Properties								•
Constructions Using Straightedge & Compass							•	•
Systematic Counting								
Uncertainty & Probability								
Real Numbers & Their Properties								
Congruence & Similarity								•
Slope								•
Validation & Justification								
Estimating Quantity & Size			•	•				

In this table Schmidt finally superimposes the original sequence of TIMSS A+ countries (dots) on top of the Common Core sequence (shaded).

Note that it still *looks* triangular and coherent.

Because visually, the shaded regions capture the eye.

Fig. 3: Mathematics topics intended at each grade in top-achieving A+ countries compared to the CCSS

Topic	Grade							
	1	2	3	4	5	6	7	8
Whole Number Meaning	•	•	•	•	•			
Whole Number Operations	•	•	•	•	•			
Properties of Whole Numbers Operations				•	•			
Fractions			•	•	•			
Measurement Units	•	•	•	•	•	•	•	
Polygons & Circles			•	•	•	•	•	•
Data Representation & Analysis			•	•	•	•	•	
3-D Geometry							•	•
Measurement Estimation & Errors							•	•
Number Theory				•	•	•	•	•
2-D Geometry Basics			•	•	•	•	•	•
Rounding & Significant Figures				•	•	•	•	
Relation of Decimals & Fractions				•	•	•	•	
Estimating Computations				•	•	•	•	
Perimeter, Area & Volume			•	•	•	•	•	•
Equations & Formulas			•	•	•	•	•	•
Decimals				•	•	•	•	
Patterns, Relations & Functions							•	•
Geometric Transformations							•	•
Properties of Decimals & Fractions				•	•	•	•	
Orders of Magnitude							•	•
2-D Coordinate Geometry					•	•	•	•
Exponents, Roots & Radicals					•	•	•	•
Percentages					•	•	•	•
Negative Numbers, Integers & Their Properties					•	•	•	•
Proportionality Concepts					•	•	•	•
Proportionality Problems					•	•	•	•
Rational Numbers & Their Properties					•	•	•	•
Constructions Using Straightedge & Compass							•	•
Systematic Counting								
Uncertainty & Probability								
Real Numbers & Their Properties								
Congruence & Similarity								•
Slope								•
Validation & Justification								
Estimating Quantity & Size				•	•			

Here we highlight the original TIMSS A+ sequence rather than the re-ordered Common Core

Does the topic progressions now seem “orderly and coherent”?

Fig. 3: Mathematics topics intended at each grade in top-achieving A+ countries compared to the CCSS

Misleading Conclusions, Sloppy Math

Yet Schmidt & Houang still conclude:

“There being no major differences between the two sets of standards, this provides further evidence that the CCSSM are coherent and very consistent with the international benchmark. Overall, the A+ had a total congruence value of 833 (out of 1,000), which implies an almost 85% degree of consistency with the CCSSM.”

If one simply counts the grids in Figure 3 (each grid box denoting a “topic-year”), CCSSM has 131 topic-years filled, with 45 of them not present in the A+ countries, while 15 of the topic-years of the A+ countries are not covered by CCSSM. **In total, 60 out of 131 topic-years, almost half (46%) are misaligned between the TIMSS A+ countries and CCSSM.**

Topic	Grade							
	1	2	3	4	5	6	7	8
Whole Number Meaning	•	•	•	•	•			
Whole Number Operations	•	•	•	•	•			
Properties of Whole Numbers Operations				•	•			
Fractions			•	•	•			
Measurement Units	•	•	•	•	•	•	•	
Polygons & Circles			•	•	•	•	•	•
Data Representation & Analysis			•	•	•	•	•	
3-D Geometry							•	•
Measurement Estimation & Errors							•	•
Number Theory							•	•
2-D Geometry Basics			•	•	•	•	•	•
Rounding & Significant Figures								
Relation of Decimals & Fractions				•	•	•	•	
Estimating Computations				•	•	•	•	
Perimeter, Area & Volume			•	•	•	•	•	
Equations & Formulas			•	•	•	•	•	
Decimals				•	•	•	•	
Patterns, Relations & Functions							•	•
Geometric Transformations							•	•
Properties of Decimals & Fractions				•	•	•	•	
Orders of Magnitude							•	•
2-D Coordinate Geometry					•	•	•	•
Exponents, Roots & Radicals					•	•	•	
Percentages					•	•	•	
Negative Numbers, Integers & Their Properties					•	•	•	
Proportionality Concepts					•	•	•	
Proportionality Problems					•	•	•	
Rational Numbers & Their Properties					•	•	•	
Constructions Using Straightedge & Compass							•	•
Systematic Counting								
Uncertainty & Probability								
Real Numbers & Their Properties								
Congruence & Similarity								•
Slope								•
Validation & Justification								
Estimating Quantity & Size				•	•			

Fig. 3: Mathematics topics intended at each grade in top-achieving A+ countries compared to the CCSS

Coding Sloppiness:

Topic	Grade							
	1	2	3	4	5	6	7	8
Whole Number Meaning	●	●	●	●	●			
Whole Number Operations	●	●	●	●	●			
Properties of Whole Numbers Operations			●	●	●			
Fractions			●	●	●	●		
Measurement Units	●	●	●	●	●	●	●	●
Polygons & Circles			●	●	●	●	●	●
Data Representation & Analysis			●	●	●	●		
3-D Geometry							●	●
Measurement Estimation & Errors							●	●
Number Theory							●	●
2-D Geometry Basics			●	●	●	●	●	●
Rounding & Significant Figures			●	●	●	●		
Relation of Decimals & Fractions			●	●	●	●		
Estimating Computations			●	●	●	●		
Perimeter, Area & Volume			●	●	●	●	●	●
Equations & Formulas			●	●	●	●	●	●
Decimals			●	●	●	●		
Patterns, Relations & Functions			●	●	●	●	●	●
Geometric Transformations			●	●	●	●	●	●
Properties of Decimals & Fractions			●	●	●	●	●	●
Orders of Magnitude			●	●	●	●	●	●
2-D Coordinate Geometry			●	●	●	●	●	●
Exponents, Roots & Radicals			●	●	●	●	●	●
Percentages			●	●	●	●	●	●
Negative Numbers, Integers & Their Properties			●	●	●	●	●	●
Proportionality Concepts			●	●	●	●	●	●
Proportionality Problems			●	●	●	●	●	●
Rational Numbers & Their Properties			●	●	●	●	●	●
Constructions Using Straightedge & Compass							●	●
Systematic Counting							●	●
Uncertainty & Probability							●	●
Real Numbers & Their Properties							●	●
Congruence & Similarity							●	●
Slope							●	●
Validation & Justification							●	●
Estimating Quantity & Size			●	●				

To make it worse, even the coding of the Common Core standards by topics, done by Schmidt's graduate students, is sloppy.

In Summary:
GIGO
 (Garbage In, Garbage Out)

Makes no sense that they are the same content in grades 2-3 of CC and grades 7-8 of A+

Incorrect coding! Both are high school topics in Common Core.

● Topic Intended in Two-Thirds or More of Top Achieving Countries
 ■ Topic Intended in Common Core Standards

Enough of what other people say
about them.

Instead, let's look at them.

Development of perimeter and area of a circle

Common Core

California State Standards

Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle. (Grade 7)

Identify the radius and diameter of a circle. (Grade 4)

Understand the concept of a constant such as π ; know the formulas for the circumference and area of a circle. (Grade 6)

Know common estimates of π (3.14; $22/7$) and use these values to estimate and calculate the circumference and the area of circles; compare with actual measurements. (Grade 6)

Use formulas routinely for finding the perimeter and area of basic two-dimensional figures and the surface area and volume of basic three-dimensional figures, including rectangles, parallelograms, trapezoids, squares, triangles, circles, prisms, and cylinders. (Grade 7)

Integer arithmetic in grades K-8

The Common Core meanders through teaching the basic four operations with integers, unnecessarily confuses students along the way, and defers fluency for addition/ subtraction to grade 4, multiplication to grade 5, and division to grade 6. This is a year or more behind high achieving countries and states.

Common Core Add/Subtract Development

Gr. 1: Apply **properties of operations as strategies** to add and subtract

Gr. 1: Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use **strategies such as counting on; making ten decomposing a number leading to a ten; using the relationship between addition and subtraction; and creating equivalent but easier or known sums.**

Gr. 2: Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.

Gr. 2: Fluently add and subtract within 100 **using strategies based on place value, properties of operations**, and/or the relationship between addition and subtraction.

Gr. 2: Add and subtract within 1000, **using concrete models or drawings and strategies based on place value, properties of operations**, and/or the relationship between addition and subtraction

Gr. 2: **Explain why addition and subtraction strategies work, using place value and the properties of operations.**

Gr. 3: Fluently add and subtract within 1000 using **strategies and algorithms based on place value, properties of operations**, and/or the relationship between addition and subtraction.

Gr. 4: Fluently add and subtract multi-digit whole numbers **using the standard algorithm.**

➤ **“Within the document itself, there seems to be a minor war going on”**

(Prof. Jim Milgram, Testimony before the California Academic Content Standards Commission, 2010)

Major Holes in Grades K-8

- The Common Core forgot to teach **prime decomposition**
 - Hence it can never teach finding lowest common multiples (LCM) or greatest common factors (GCF), important for handling fractions.
- The Common Core forgot to teach **conversion between fractions, decimals, and percents.**
 - Fluent conversion identified as key skill by NCTM (*Curriculum Focal Points*), NRC (*Adding It Up*) and the National Advisory Math Panel (*Foundations for Success*).
- The Common Core doesn't build up finding **areas of triangles** but expect them to be known in grade 6; it doesn't teach the **sum of angles in a triangle** until grade 8.

Mediocrity: Gutting Algebra in Grade 8

- The Common Core abandoned long-standing efforts to teach Algebra I to prepared student in grade 8.
 - All high achieving countries do it
 - US states moved from about 15% to over 50% students taking Algebra I by grade 8
 - Disadvantaged students were the major beneficiaries of this effort because they tend not to get support outside school
- But the Common Core abandoned all that and designated Algebra I as a high school course.
 - Number of disadvantaged students taking it will drop drastically as the regular in-school program does not prepare students
 - Fewer students will be able to take AP Calculus by grade 12
(Recall that the College Board admits now that Common Core is incompatible with AP Calculus.)

Mediocrity: Standards Do Not Make Students College Ready

- The Common Core defined its “Career- and College-Readiness” below today’s minimum requirements to enroll in essentially all 4-year state colleges
 - Colleges require Algebra I, Geometry, and Algebra II as a minimum
 - Common Core’s Geometry and Algebra II **exclude significant content** such as arithmetic and geometric sequences, mathematical induction, and more. It also de-emphasizes procedural fluency.
 - **Algebra II today is already marginal** for college admission; Common Core’s diluted Algebra II will pressure colleges to accept it, yet it will increase the need for remediation in college.

Cost of Assessment

Costs of Current ISAT

- ISAT is made of
 - Reading, Language, and Math in grades 3-8 and 10.
 - 90 minutes for each session – **4.5 hours total**
 - Science in grades 5,7, and 10
 - **One testing window of about 4 weeks**
- Costs about \$6M spread across 150,000 tested students

Costs of Smarter Balanced (SBAC)

- SBAC is made of
 - ELA and Math in grades 3-8 and 11
 - **7 to 8.5 hours total**, depending on grade. **Almost double of today.**
 - **Two testing windows of 4 weeks each.**
- Claims to cost about \$3.4M spread across 150,000 tested students (+\$0.6M for science testing as today's ISAT)
 - SBAC estimates that it will cost Idaho only about \$16/student to score & report, including hand-scores performance items. Past experience in California & Kentucky shows this cost to be grossly lowballed.

The Real Cost of SBAC Testing

- Two testing windows of 4 weeks
 - **Robs schools of almost 20% instruction time with disrupted and light-weight schedule during testing periods**
 - **Takes away computers from classroom instruction to testing for 20% of the school year**
- Using historical data from Calif. & Kentucky, hand scoring of performance items will cost at least \$25-\$40/student
 - **Realistically, SBAC costs will be between \$6M and \$8.3M**

Dedicated computers for testing?

- Will eliminate some of the impact of removing computers from classroom for two months each school year.
- Will assure better experience for tested students with faster hardware and higher resolution displays
- Hardware will better match SBAC technical requirements

But at what cost?

- **Adding 37,500 computers for testing (1/4 of 150,000 students)**
- **\$20M annual cost for computers, server infrastructure, electrical and HVAC, additional bandwidth, insurance, support**

Technology Costs Analysis

- 150,000 out of 280,000 K-12 students need to be tested (grades 3-8 and 10)
- Assume 4:1 student/computer ratio needed for testing
- Assume \$1000 cost of computer. This splits around 50%-50% between cost of hardware and software
- Use industry value of 30% overhead for servers/routers/infrastructure and extra electrical & HVAC
- Two one-month testing windows
- Extra IT support needed during the testing window – prolonged disruptions are unacceptable
- Amortization over 5 years (industry standard).

Testing Cost Summary

- ISAT: **\$ 6M**
- SBAC
 - Putative cost **\$ 4.0M**
 - Realistic cost (low est.) **\$ 6M**
 - Realistic cost (high est.) **\$ 8.3M**
 - Dedicated computers **\$ 20M** **=> \$26-28.3M total**

And for what?

- **Doubling individual student testing time**
- **Doubling disruption to 20% of school year**
- **Eliminating support tracks for high achievers in ES/MS**

Earlier this week the Wall Street Journal reported that your State Superintendent Tom Luna recently told Arne Duncan that:

"It's an affront to states' rights" for the federal government to go directly to their districts.

It is unfortunate that Tom Luna sees the affront to state rights when the federal government leans on school districts, but doesn't see the same affront when the federal government leans on the states to accept the Common Core and its federally-sponsored testing monstrosities.