

Fair to Middling

A National Standards Progress Report

No. 56
March
2010

A Pioneer Institute White Paper

by R. James Milgram and Sandra Stotsky



PIONEER INSTITUTE
PUBLIC POLICY RESEARCH

PRI
PACIFIC
RESEARCH
INSTITUTE

Pioneer's Mission

Founded in 1988, Pioneer Institute is a non-partisan public policy think tank committed to keeping Massachusetts economically competitive and to strengthening the core values of an open society. To inspire market-driven policy reforms, Pioneer promotes individual freedom and responsibility and limited, accountable government. The Institute has changed the intellectual climate in Massachusetts by commissioning timely and rigorous academic studies from leading scholars. Pioneer injects new ideas into the public debate through forums and lectures, transcripts, the media, and outreach to legislators, business groups and the general public.

Pioneer's Centers

■ **This paper is a publication of the Center for School Reform** which seeks to increase the education options available to parents and students, drive system-wide reform, and ensure accountability in public education. The Center's work builds on Pioneer's legacy as a recognized leader in the charter public school movement, and as a champion of greater academic rigor in Massachusetts' elementary and secondary schools. Current initiatives promote *choice and competition, school-based management, and enhanced academic performance in public schools*.

The Shamie Center for Better Government seeks limited, accountable government by promoting competitive delivery of public services, elimination of unnecessary regulation, and a focus on core government functions. Current initiatives promote *reform of how the state builds, manages, repairs and finances its transportation assets as well as public employee benefit reform*.

The **Center for Economic Opportunity** seeks to keep Massachusetts competitive by promoting a healthy business climate, transparent regulation, small business creation in urban areas and sound environmental and development policy. Current initiatives promote market reforms to *increase the supply of affordable housing, reduce the cost of doing business, and revitalize urban areas*.

Pioneer Institute is a tax-exempt 501(c)3 organization funded through the donations of individuals, foundations and businesses committed to the principles Pioneer espouses. To ensure its independence, Pioneer does not accept government grants.

Fair to Middling

A National Standards Progress Report

R. James Milgram

Sandra Stotsky

Contents

Executive Summary	1
Purpose	3
Major Issues in Common Core’s March Draft of Grade-Level Mathematics Standards	3
A. Common Core’s Uneven Mathematics Standards in the Primary Grades	4
B. Low Mathematics Expectations by the End of the Elementary Grades	7
C. Delayed Development of Pre-Algebra Skills	7
D. Two Major Issues in Grades 7 and 8	8
E. Issues With the High School Standards	9
F. Concluding Comments and Caveats	10
Major Issues in Common Core’s March Draft of Grade-Level ELA Standards	11
A. An Organizing Scheme Incapable of Generating Grade-Level Academic Standards in Reading	11
B. No Reliable and Valid Basis for Common Grade-Level Assessments or High School Exit Tests	14
C. An Unneeded “Complexity” Formula to Help English Teachers Judge the Complexity of the Literature They Teach	17
D. Pedagogically Weak, if Not Useless, Vocabulary Standards in Grades 6-12	19
E. A Misleading Reference to NAEP’s Percentages for Passage Distribution on Reading Tests	20
F. No International Benchmarking	21
G. Concluding Comments and Caveats	21
Recommendations	21
About the Authors	23
Endnotes	24
Appendix	25

Executive Summary

Many Americans support the idea of common, or national, standards. They believe that if they are properly designed and appropriately implemented, national standards would ensure that all students, no matter where they live and what school they attend, are taught a body of common national and world knowledge, acquire a mature understanding and use of the English language, and gain enough mathematical knowledge and skill to participate competitively in the 21st-century global economy. These results remain to be demonstrated, however, and much depends on the quality and rigor of these standards.*

The purpose of this April 2010 progress report is to indicate how Common Core's March drafts have addressed the deficiencies and limitations in its September and January drafts, and to spell out major areas needing further work. The analysis we present in this progress report shows that, although progress has been made, considerably more work is needed, particularly at the secondary level, to enable Common Core's mathematics and English language arts (ELA) standards to be internationally benchmarked and to serve as the basis for valid and reliable high school exit level assessments.

While Common Core's mathematics standards do not match up well with the top state standards in this country or with the best international standards, they are far more demanding and mathematically rigorous than the mathematics standards in the vast majority of our states. However, its leisurely development of basic arithmetic skills and failure to prepare students for an authentic Algebra 1 course in grade 8 mean that Common Core's mathematics standards are at a significantly lower level than those in California, Massachusetts, Minnesota, and Indiana and in the highest-achieving countries. Although Texas's current high school standards are not at the level of those in the top-rated states, it has solid standards in the early grades that are at the level of Common Core's draft mathematics

standards or better. Our basic concern is whether final decisions *not* to align with the most demanding mathematics standards in this country and elsewhere have already been made.

Considerable progress has been made in addressing the deficiencies in the January draft of Common Core's grade-level standards for reading and the English language arts, but much more work remains to make its ELA standards as good as, if not better than, those in the top-rated states in this country (California, Indiana, Massachusetts, and Texas). The most serious problem with Common Core's ELA standards remains its organizational scheme. A set of generic, content-free, and culture-free skills do not serve as the basis for generating grade-level academic standards, especially at the high school level, and as the basis for reliable and valid common assessments. Until the damaging limitations of the current organizing scheme are removed and an academically sound organizing scheme is used, Common Core's draft writers will not be able to generate developmental progressions of coherent and academically sound grade-level and high school exit standards that lead to common curricular expectations in reading through the grades. Nor will they be able to assure the states that common assessments based on the kind of standards we see in the March draft will lead to valid and reliable assessments of student learning.

Our recommendations are designed with a constructive goal in mind—to make our national standards in ELA and mathematics at least as good as those in states that have empirical evidence, within the state, nationally, and/or internationally, attesting to the effectiveness of their current standards.

For Mathematics

1. Address the slow pacing of the development of basic skills in arithmetic by requiring near mastery of multiplication and basic skills with long division by the end of grade 4. At worst, our grade 4 expectations should be comparable with Singapore's grade 3 expectations.

1 *Nothing in this report is to be construed as necessarily reflecting the views of the co-publishing organizations.

2. Introduce core pre-algebra skills in the early grades and continue to develop them, thus aligning with what the top state standards and high-achieving countries do.
3. Revise the approach to geometry in middle and high school to reflect proven programs and approaches.
4. Present concepts such as the associative law, commutative law, and distributive law in an age-appropriate way.
5. Revise and reorder the high school material but do not weaken the overall mathematics content that all students receive in high school. In high-achieving countries, typically over 90 percent of the population graduates from high school and calculus is a high school graduation requirement.

For the English Language Arts

1. Replace the ten culture-free and content-empty College- and Career-Readiness Standards for Reading in the March draft with standard D and its subsidiary standards in David Conley's 2003 list and with the first two standards in Achieve's American Diploma Project's high school exit test for ELA.
2. Remove material on the "complexity" formula, which cannot easily be used by elementary teachers, won't be used by appropriately educated English teachers, and is inappropriate to include in a standards document.
3. Completely revise the vocabulary strand in grades 6-12 and remove the pedagogically weak or useless standards.
4. Remove all the "literacy standards for history/ social studies and science" from future drafts for ELA *unless* English teachers are given sufficient scholarly information on the historical context and political significance of the many fine historical documents listed in the March ELA draft for teaching students how to understand them.
5. Aim for an appropriate balance of secondary-level reading and writing standards that makes sense to English teachers, strengthens the

secondary English curriculum, and prepares all students for college. The March draft has 9 standards for literary reading and 10 for informational reading, an almost equal weighting that leads to an unbalanced high school English curriculum. The draft also divides composition into three equal sets of standards: one for narrative writing, another for argumentative or opinion-based writing, and the third for informational or explanatory writing, an equal weighting that leads to a lack of balance through the grades. To make sense to English teachers, about 60 percent of the reading standards should address literary reading, and about 40 percent should address informational reading. To prepare all students appropriately for college, the bulk of student writing in the secondary grades should be analytical writing, to compensate for the inordinate stress on experience-based narrative writing in K-8.

Purpose

Many Americans support the idea of common, or national, standards. They believe that if they are properly designed and appropriately implemented, national standards would ensure that all students, no matter where they live and what school they attend, are taught a body of common national and world knowledge, acquire a mature understanding and use of the English language, and gain enough mathematical knowledge and skill to participate competitively in the 21st-century global economy. These results remain to be demonstrated, however, and much depends on the quality and rigor of these standards.*

In February 2010, Pioneer Institute issued a White Paper titled *Why Race to the Middle?*. The report presented a critique of the September 2009 draft of the College- and Career-Readiness Standards developed by the National Governors Association and the Council of Chief State School Officers in a joint project (henceforth called Common Core), as well as of the January drafts of Common Core's grade-level standards for K-12. *Why Race to the Middle?* concluded that Common Core had not yet produced standards in either subject that will improve the education of most, never mind all, American students and enhance this country's competitive position in a global economy.

The purpose of this April 2010 progress report is to indicate how well Common Core's March drafts have addressed the deficiencies and limitations in its September and January drafts, and to spell out major areas needing further work. The analysis we present in this progress report shows that, although improvements have been made, considerably more work is needed, particularly at the secondary level, to enable Common Core's standards to be internationally benchmarked and to serve as the basis for valid and reliable high school exit level assessments. Fortunately, there is time for this work to be done.

We begin with a detailed analysis of the most serious deficiencies in Common Core's March

draft. The recommendations in the final section of this document are designed with a constructive goal in mind—to make our national standards in ELA and mathematics at least as good as those in states that have indirect empirical evidence, within the state, nationally, and/or internationally, attesting to the effectiveness of their current standards.

Major Issues in Common Core's March Draft of Grade-Level Mathematics Standards

The February White Paper noted four major areas of concern: how the standards were organized, the low expectations for the meaning of college readiness, the misreading of relevant research to justify the low expectations, and the exemplars given for the standards. An inappropriate organization of the high school mathematics topics in the January draft partially concealed the omission of a large number of geometry and advanced algebra standards, such that the group of standards determining college readiness in the January draft would not be sufficient to qualify students for admission to most of this country's state colleges and universities. This lack of depth reflected an egregious misreading of key research on how high-achieving countries focus their standards.

Many of the problems in the January draft have been addressed in the March public comment draft and, overall, the proposed standards are far better than most current state standards (a back-handed compliment, to a large extent). The proposed standards are, however, very uneven in quality and do not match up well either with the best state standards or with international expectations. While most of the key high school topics in second-year algebra and geometry are now present, the high school standards remain inappropriately organized for teachers and textbook publishers. We present comments and suggestions on the important issues that remain to be addressed, by educational level and by topic.

*Nothing in this report is to be construed as necessarily reflecting the views of the co-publishing organizations.

A. Common Core’s Uneven Mathematics Standards in the Primary Grades

Common Core’s standards in the primary grades are uneven in two different ways. They are written in distinctly different styles at vastly different levels of mathematical sophistication, apparently with vastly different assumptions about students’ backgrounds, and they begin with the wrong emphasis. We begin with a discussion of the latter issue.

Most teachers in the early grades in the United States tend to try to teach mathematics as a special form of reading. They focus on the way numbers are said and read, and on irregular word forms such as “eleven,” “twelve,” “twenty,” “thirty,” and so on. Thus, *number names* become the focus of instruction, not the *special properties of numbers* that students must understand to become proficient with numbers.

Although emphasis on the development of the number concept is clear in top-rated state standards and in high-achieving countries, Common Core’s initial focus is on vocabulary rather than the properties of numbers. Here are Common Core’s first three Kindergarten math standards:

1. *Say* the number name sequence to 100.
2. Know the *decade words* to ninety and recite them in order (“ten, twenty, thirty, ...”).
3. *Say* the number name sequence forward or backward beginning from a given number within the known sequence (instead of always beginning at 1).

In contrast to these three reading standards, here are California’s first four Kindergarten standards:

- 1.1 *Compare two or more sets of objects* (up to 10 objects in each group) and identify which set is equal to, more than, or less than the other.
- 1.2 Count, recognize, represent, name, and order a number of objects (up to 30).

Which numbers are missing if we are counting by ones? 11, 12, 13, __, __, 16, 17, __, __, __, 21, 22, 23, 24.

1.3 Know that the larger numbers describe sets with more objects in them than the smaller numbers have.

2.1 Use concrete objects to determine the answers to addition and subtraction problems (for two numbers that are each less than 10).

California’s standards first focus on numbers as objects with special *properties*—they can be compared, they have magnitude, and they can be used to represent the sizes of finite sets. They can also be added and subtracted. But in Common Core’s standards, numbers are nothing more than oral and reading vocabulary in Kindergarten. They can be *read aloud* and, from the outset, read aloud as irregular number words, as, e.g., *thirty* and *forty*, not as three tens and four tens. This difference in approach also appears in the Minnesota, Massachusetts, and Indiana standards. The vast majority of the other states begin with an approach similar to Common Core’s.

Emphasis on the development of the *number concept* in the early grades is also clear in high-achieving countries. Here are the first sentences of the first volume of the Hungarian teacher training texts in mathematics:

When a parent takes his child to first grade, he is usually happy to tell the teacher that little Tommy can already count to 100. Sometimes it turns out (and the sooner the better) that the correctly named numbers by this same child have no content; the child knows the numerals, but not the concept of numbers. He can say the words in order: one, two, three... thirty-eight, thirty-nine, forty, forty-one, and so on. But he cannot really tell which one is more: 5 apples or 7 apples, nor does he have a clear picture about the order of size, equalities, or the contents of the numerals.

We need to add quickly that this is not a problem: Building the concept of numbers

■ Fair to Middling

is the task of the school. If a child doesn't possess the concept of numbers when starting school, then he will learn it with the teacher's help; it's not too late in the first grade.

One might be tempted to conclude from Common Core's first math standards that its approach is little more than *business as usual* in mathematics instruction and legitimate cause for concern. But this conclusion would be wrong.

As conventional as Common Core's Kindergarten standards are, the grade 1 standards are unlike corresponding grade 1 standards in any state document. They are closely aligned with the grade 1 standards of high-achieving countries in many ways but use language more characteristic of a third-year university course in modern algebra.

Addition and subtraction are introduced in grade 1 in Common Core's March draft as follows:

1. Understand the properties of addition.
 - a. Addition is commutative. For example, if 3 cups are added to a stack of 8 cups, then the total number of cups is the same as when 8 cups are added to a stack of 3 cups; that is, $8 + 3 = 3 + 8$.
 - b. Addition is associative. For example, $4 + 3 + 2$ can be found by first adding $4 + 3 = 7$ then adding $7 + 2 = 9$, or by first adding $3 + 2 = 5$ then adding $4 + 5 = 9$.
 - c. 0 is the additive identity.
2. Explain and justify properties of addition and subtraction, e.g., by using representations such as objects, drawings, and story contexts. Explain what happens when:
 - a. The order of addends in a sum is changed in a sum with two addends.
 - b. 0 is added to a number.
 - c. A number is subtracted from itself.
 - d. One addend in a sum is increased by 1 and the other addend is decreased by 1. Limit to two addends.

3. Understand that addition and subtraction have an inverse relationship. For example, if $8 + 2 = 10$ is known, then $10 - 2 = 8$ and $10 - 8 = 2$ are also known.

By comparison, see Singapore's corresponding grade 1 standards below. While they are more technically demanding, they are less conceptually challenging.


- concepts of addition and subtraction,
- use of the addition symbol (+) or subtraction symbol (−) to write a mathematical statement for a given situation,
- comparing two numbers within 20 to tell how much one number is greater (or smaller) than the other,
- recognizing the relationship between addition and subtraction,
- building up the addition bonds up to $9 + 9$ and committing to memory,
- solving 1-step word problems involving addition and subtraction within 20,
- addition of more than two 1-digit numbers,
- addition and subtraction within 100 involving:
 - o a 2-digit number and ones,
 - o a 2-digit number and tens,
 - o two 2-digit numbers, and
- addition and subtraction using formal algorithms.

In contrast, Russian texts explicitly introduce both the commutative and associative laws in grade 1 but do so in an age-appropriate manner not hinted at in Common Core's draft (see Figure 1).

Multiplication and division are also introduced in grade 1 in Singapore's standards and in those of some other high-achieving countries, although grade 2 is more typical. They also appear in grade 2 in California's standards. They appear in grade 3 only in Common Core's draft, Minnesota's




Figure 1: The Commutative and Associative Rules in the Russian Curriculum

Interchanging Addends.



$$2 + 1 = 3$$

$$1 + 2 = 3$$

 1. $3 + 1$ $1 + 3$	 $4 + 2$ $2 + 4$	 $5 + 1$ $1 + 5$
---	---	---

2. $1 + 4 = 5$	3. $4 + 2 = 7$	4. $3 + 2 = 5$
$4 + \square = 5$	$4 + \square = 7$	$2 + \square = 5$


A sum does not change
if the addends are interchanged.


3. $10 - 4$	8 - 3	6 - 4	10 - 3	6 + 3 - 2	9 - 1 + 2
$9 - 4$	$8 - 4$	$7 - 4$	$10 - 2$		


51

Adding a Sum to a Number.

$4 + (2 + 1)$



$$4 + (2 + 1) = 4 + 3 = 7$$


$$4 + (2 + 1) = (4 + 2) + 1 = 6 + 1 = 7$$


$$4 + (2 + 1) = (4 + 1) + 2 = 5 + 2 = 7$$

125

Source: Moro, Bantova, Beltyukova, *Russian Grade One Mathematics*, 1980, translated by UCSMP

standards, and Massachusetts's standards. As was the case with Common Core's standards for addition and subtraction, the multiplication standards are also written at close to a university level:

1. Understand that multiplication of whole numbers is repeated addition. For example, 5×7 means 7 added to itself 5 times. Products can be represented by rectangular arrays, with one factor the number of rows and the other the number of columns.
2. Understand the properties of multiplication.
 - a. Multiplication is commutative. For example, the total number in 3 groups with 6 things each is the same as the total number in 6 groups with 3 things each, that is, $3 \times 6 = 6 \times 3$.

b. Multiplication is associative. For example, $4 \times 3 \times 2$ can be calculated by first calculating $4 \times 3 = 12$ then calculating $12 \times 2 = 24$, or by first calculating $3 \times 2 = 6$ then calculating $4 \times 6 = 24$.

c. 1 is the multiplicative identity.

d. Multiplication distributes over addition (the distributive property). For example, $5 \times (3 + 4) = (5 \times 3) + (5 \times 4)$.

B. Low Mathematics Expectations by the End of the Elementary Grades

As the examples above indicate, Common Core's March draft fails to develop its math standards in the primary grades with a consistent voice. There is a more serious problem by the end of the elementary grades: low expectations.

A slowdown in the development of basic arithmetic skills begins in the early elementary grades and continues into the upper elementary grades in Common Core's March draft. We frequently see pairs of standards like the following grade 2 standards from *Adding and subtracting in base ten* that require a generalized theoretical understanding but only some practice with the standard algorithms. They do not specify mastery.

12. Explain why addition and subtraction strategies and algorithms work, using place value and the properties of operations. Include explanations supported by drawings or objects. A range of reasonably efficient algorithms may be covered, not only the standard algorithm.

13. Compute sums of two three-digit numbers, and compute sums of three or four two-digit numbers, using the standard algorithm; compute differences of two three-digit numbers using the standard algorithm.

On the other hand, the corresponding California grade 2 standard is much more direct and less potentially confusing.

2.2 Find the sum or difference of two whole numbers up to three digits long. Use drawings of tens and ones to help find the sum $37 + 17$ and the difference $25 - 19$. Now do the same problems again using addition and subtraction algorithms. (The standard algorithms are illustrated here.)

Similarly, here is the corresponding Massachusetts grade 2 standard:

2.N.10 Demonstrate the ability to add and subtract three-digit numbers accurately and efficiently.

Mastery of single digit addition is not expected in Common Core's draft standards until the end of grade 2, and mastery of single digit multiplication is not expected until the end of grade 4. Both are at least a year too late. Indeed, basic arithmetical knowledge and skills are not fully developed until sometime in grade 5 in Common Core's March draft. *By that time, our students will be nearly two years behind their peers in high-achieving countries.* The problem is that students need a strong background in whole number arithmetic before grade 5: they need a solid understanding of place value and they need to understand why standard algorithms work as well as have automatic recall of number facts in order to be able to handle fractions in the upper elementary grades (and, ultimately, algebra). It is far from clear that the standards in Common Core's March draft can ensure this level of mastery for the study of fractions.

C. Delayed Development of Pre-Algebra Skills

In high-achieving countries and in the top state standards, considerable attention is paid to developing basic skills in algebra from the primary grades on. Not so in Common Core's draft. In California's grade 3 standards we find:

1.1 Represent relationships of quantities in the form of mathematical expressions, equations, or inequalities. Write an inequality, equality, or expression to show each of the following relationships:

1.12 plus a number is less than 30.

2. 4 times 6 is equal to 3 times a number.

1.2 Solve problems involving numeric equations or inequalities.

If $6 + N > 9$, circle all the numbers that N could be 3, 2, 4, 1, 0, 8, 5.

1.3 Select appropriate operational and relational symbols to make an expression true (e.g., if $4 _ 3 = 12$, what operational symbol goes in the blank?).

1.4 Express simple unit conversions in symbolic form (e.g., $_ \text{ inches} = _ \text{ feet} \times 12$).

In grade 4 we find:

1.5 Understand that an equation such as $y = 3x + 5$ is a prescription for determining a second number when a first number is given.

2.1 Know and understand that equals added to equals are equal.

2.2 Know and understand that equals multiplied by equals are equal.

But, no comparable development takes place in Common Core's March draft until grade 6, when convoluted standards corresponding to the above standards appear (see *Expressions and Equations*, p. 32).

As challenging as California's algebra standards are, the standards of high-achieving countries are even more demanding. They are on average about one year ahead of California's standards. In grade 7, the study of algebra typically begins in earnest in these countries. Since success in algebra, particularly Algebra II, is the single most important predictor of success in college,¹ we should be particularly concerned about Common Core's delay in preparing students for algebra. This is a deep concern for California. As Pioneer Institute's White Paper in February pointed out, more than 60% of California students currently complete Algebra I successfully in grade 8.

D. Two Major Issues in Grades 7 and 8

The first issue is with the delayed development of pre-algebra skills and concepts apparent in the elementary grades, entailing constraints on options for the grade-level placement of an Algebra 1 course. The second is with geometry. A new and unusual approach to geometry is put forward, an approach that seems more natural in

advanced undergraduate courses at the university level for math majors.

1. Inadequate preparation for algebra. Because of the failure of Common Core's March draft to develop basic pre-algebra skills in K - 6, the treatment of algebra in grade 7 and grade 8 is fragmentary. Currently, only bits and pieces of algebra are present in grade 8, with very little connection among them. The March draft does not make any attempt to prepare students for an authentic Algebra 1 course in grade 8. However, a member of the writing group expressed willingness at a Massachusetts Board of Education meeting on March 23 to add an additional pathway to the two pathways now presented for the secondary grades that would show how K-7 standards could prepare students adequately for an authentic Algebra I course in grade 8. The addition of this third optional pathway would answer the objections of the states with the most rigorous mathematics standards—to the effect that if they adopted Common Core's present mathematics standards, they would be weakening their current mathematics expectations.

Two topics that are foundational for algebra are inadequately addressed in grades 7 and 8 in Common Core's March draft: the development of irrational numbers and the function concept. The existence of irrational numbers is one of the chief concepts to develop in middle school math. It gives key preparation for the study of real numbers and should give students one of their first exposures to rigorous proofs. But the key grade 7 standard on page 35, *The Number System* (shown below), does not accomplish either objective.

4. Understand that there are numbers that are not rational numbers called irrational numbers, e.g. π and $\sqrt{2}$.

How are students to know there are irrational numbers short of simply being told so by their teachers? The usual approach in a rigorous curriculum is to develop the understanding that the infinite decimal expansion of any rational number is ultimately periodic and then have

■ Fair to Middling

students construct infinite decimals that are not ultimately periodic. Such a number must be irrational. The lack of an authentic standard on the topic is made more obvious by the related grade 8 standard on page 39:

2. Informally explain why $\sqrt{2}$ is irrational.

The material on functions on pages 39 and 40 seems to be almost entirely unmotivated, and it is far from clear what the point is. For example, there is no background for the following standard on Functions:

2. *Evaluate expressions that define functions, and solve equations to find the input(s) that correspond to a given output.*

In the proper context this is a very important standard. The question “Why would somebody want to do this?” needs to be carefully addressed before this standard is stated.

2. An unproven approach to geometry.

Common Core’s March draft uses an idiosyncratic and entirely unproven approach to geometry in grades 7 and 8. This approach is focused on deriving the key properties of plane geometry from the properties of rigid motions. This kind of approach is often used in university level courses for mathematics majors. But such students have far more background than seventh and eighth graders. Here are three grade 7 geometry standards (p.36):

2. Understand the meaning of congruence: a plane figure is congruent to another if the second can be obtained from the first by a rigid motion.
3. Verify experimentally that a dilation with scale factor k preserves lines and angle measure, but takes a line segment of length L to a line segment of length kL .
4. Understand the meaning of similarity: a plane figure is similar to another if the second can be obtained from the first by a similarity transformation (a rigid motion followed by a dilation).

Here are the first five grade 8 geometry standards (p. 40):

1. Use coordinate grids to transform figures and to predict the effect of dilations, translations, rotations and reflections.
2. Explain using rigid motions the meaning of congruence for triangles as the equality of all pair of sides and all pairs of angles.
3. Give an informal explanation using rigid motions of the SAS and ASA criteria for triangle congruence, and use them to prove simple theorems.
4. Explain using similarity transformations the meaning of similarity for triangles as the equality of all pairs of angles and the proportionality of all pairs of sides.
5. Give an informal explanation using similarity transformations of the AA and SAS criteria for triangle similarity, and use them to prove simple theorems.

There is no tradition in this country to support this approach to geometry, there is no reasonable expectation that grades 7 and 8 math teachers have the background to teach this material, and there is no evidence that such an approach to geometry will result in improved student outcomes. Indeed, this approach seems to have been tried out in Russia about 25 years ago and it did not work. The Russians quickly changed to a more traditional approach.

E. Issues with the High School Standards

Virtually all the expected mathematics in Algebra I, Algebra II, and Geometry is present at the high school level. But it is widely scattered and disorganized. Consequently, it is difficult to review.

For example, the first “strand,” *Numbers and Quantity* (pp. 43-45), goes all the way through complex numbers, vectors, and matrices — material that will typically be taught in several different courses — and contains 37 separate expectations.

The next strand, *Algebra* (pp. 46-48), contains, for the most part, material that should be present in a legitimate Algebra I course even though it contains 44 separate expectations. There are a few expectations, labeled STEM, that are usually contained in an Algebra II course, but very few of the non-STEM items are typical Algebra II material. This raises the question whether the intent is to separate “STEM” material from the regular algebra sequence, effectively weakening normal high school expectations in algebra. The wisdom of such an approach is questionable since, as noted earlier, success in Algebra II is a major predictor of success in college and over 80% of high school graduates go on to college.

The strand on functions, on the other hand, covers material in Algebra I, Algebra II, pre-calculus, and even calculus in its current 47 expectations. There will be even more expectations in the next draft as six subsections in functions have not yet been written: Limits and Continuity, Differential Calculus, Applications of Derivatives, Integral Calculus, Applications of Integration, and Infinite Series.

Finally, there are 50 separate and detailed expectations in statistics and data analysis and 62 such expectations in geometry.

It is worth comparing the level of unfiltered detail above with the structure of California’s high school standards. California’s standards are organized by major topic:

- Algebra I: 25 standards
- Geometry: 22 standards
- Algebra II: 25 standards
- Trigonometry: 19 standards
- Mathematical Analysis (pre-calculus): 8 standards
- Linear Algebra: 12 standards
- Probability and Statistics: 8 standards
- AP Probability and Statistics: 19 standards
- Calculus, 27 standards

A major cause of the lack of organization of the high school mathematics standards is that the organizing principle for the high school material is a somewhat idiosyncratic list of key mathematical headings. However, the topics listed under different headings often have close connections with each other, and it is not really possible to teach the individual headings in isolation.

The best that can be done is to construct course sequences similar to the integrated sequences in many high-achieving countries or like the traditional Algebra I, Geometry, Algebra II sequence in this country. Neither of these approaches results in a clean handling of the current topic list, but either would be more useful than what is in the March draft. A major reorganization of the high school topics, one that is more useful or familiar to teachers and publishers, is needed.

F. Concluding Comments and Caveats

The above comments may give the impression that there are severe problems with Common Core’s mathematics standards and that they are unlikely to be useful. This is not quite the case. While it is true that its standards do not match up well with the top state standards in this country or with the best international standards, they are far more demanding and mathematically rigorous than the standards in the vast majority of our states. Moreover, throughout the draft, discussions of underlying mathematical concepts are more accurate and more complete than corresponding discussions in the top state standards. In many ways, they set a high bar, but it is a very uneven one.

Common Core’s March draft is still very much a work in progress and needs much more work. At present, its leisurely development of basic arithmetic skills and failure to prepare students for an authentic Algebra 1 course in grade 8 mean that Common Core’s mathematics standards are at a significantly lower level than

those in California, Massachusetts, Minnesota, and Indiana and in high-achieving countries. Although Texas’s current high school standards are not at the level of those in the top-rated states, it has solid standards in the early grades that are at the level of Common Core’s draft mathematics standards or better. Our basic concern is whether final decisions not to aim for the best in this country and elsewhere have already been made.

Major Issues in Common Core’s March Draft of Grade-Level ELA Standards

The February White Paper noted five major areas of concern: (1) the absence of developmental progressions at successively higher grade levels for presumably related groups of standards; (2) large numbers of developmentally inappropriate, poorly written, or unintelligible standards; (3) a huge haphazard list of illustrative titles at each grade span, classified into traditional genres but with no rationale given for their choice—or links to specific standards; (4) the use of a set of skills (Core Standards) to organize the grade-level standards, and (5) the absence of international benchmarking.

The March draft shows considerable improvement in the intelligibility of the standards, and the illustrative titles are now broken down by grade level. However, the central conceptual flaw is now clearly visible—the use of an organizing framework consisting of culture-free and content-empty skills called Core Standards, or College- and Career-Readiness Standards, to generate grade-level standards. Not only can a skills-based framework *not* generate academically sound and developmentally related progressions of grade-level standards, it also *cannot* generate a valid and reliable basis for common assessments. The first three sections below explain why.

A. An Organizing Scheme Incapable of Generating Grade-Level Academic Standards in Reading

Literary study and informational reading continue to be centered on ten culture-free and content-empty College- and Career-Readiness Standards (henceforth CCRS, listed on pp. 6 and 31) that are incapable of defining readiness for college reading and generating coherent grade-level academic standards. The March draft asserts that the grade-level literature and reading standards “define what students should understand and be able to do in each grade and build toward the ten College and Career Readiness Standards.” But why grade-level literature and reading standards should build toward ten content-empty and culture-free skills purporting to define college readiness is not clear, not only because no body of empirical evidence or international benchmarks justifies them, but also because they seem to have an intellectually negative effect on the grade-level standards they directly spawn. Moreover, and this is the most worrisome aspect of these ten “standards,” despite the lack of a body of research evidence or international benchmarks to justify them, the U.S. Department of Education explicitly wants the CCRS, not grade-level standards, used as the basis for the common high school exit tests now being developed.

What is the likely source for the choice of generic, content-empty, and culture-free skills as the intellectual goal of grade-level standards in the English language arts and as the basis for grade 10 common tests (possibly leading to a “grade 10 diploma”)? A major source seems to be the skills-oriented standards in David Conley’s 2003 report *Understanding University Success*, which proposed the notion of “college readiness standards” and presented them for each major subject in the arts and sciences.² Yet, the complete list of English standards in Conley’s report, generated from a survey of college English faculty, provides clear counter-evidence

to the use of an exclusive list of culture-free and content-empty skills as the definition of college readiness in English or reading. Although his list begins with three skills-oriented standards, the fourth standard is standard D, presented here.

“D. Successful students are familiar with a range of world literature. They:

D.1. demonstrate familiarity with major literary periods of English and American literature and their characteristic forms, subjects and authors.

D.2. demonstrate familiarity with authors from literary traditions beyond the English-speaking world.

D.3. demonstrate familiarity with major works of literature produced by American and British authors.”

The overarching importance of standard D can be seen in the Appendix to this White Paper, the testimony on Common Core’s March ELA draft submitted to the New Jersey Board of Education on March 17, 2010, by an English professor at Princeton University. Yet, D is not included as a Common Core college- and career-readiness standard, and its subsidiary objectives do not appear in Common Core’s grade-level standards.

To understand the crippling limitations of these ten content-empty and culture-free “readiness” skills for generating academic grade-level literature and reading standards, we need to look at the specific grade-level standards and intellectual progressions from grades 6 to 12 that they have produced. Do these CCRS lead to academically substantive standards that enable teachers to see exactly how intellectual demands increase from grade to grade? Do they provide a clear and consistently interpretable guide to curriculum content to teachers? Here are the first two of the ten standards for Literature and Reading in each grade from grades 6 to 12. The introduction claims they “offer a focus for instruction each year and help ensure that students gain adequate exposure to a range of texts and tasks...”

For Literature:

Grade 6: 1. Cite specific textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

Grade 7: 1. Cite several sources of textual evidence when useful to support analysis of what the text says explicitly as well as inferences drawn from the text.

Grade 8: 1. Cite a wide range of evidence throughout the text when useful to support analysis of what the text says explicitly as well as inferences drawn from the text.

Grades 9/10: 1. Cite the evidence in the text that most strongly supports a specific analysis of what the text says explicitly as well as inferences drawn from the text.

Grades 11/12: 1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves things uncertain.

For Reading:

Grade 6: 1. Cite specific textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

Grade 7: 1. Cite several sources of textual evidence when useful to support analysis of what the text says explicitly as well as inferences drawn from the text.

Grade 8: 1. Cite a wide range of evidence throughout the text when useful to support analysis of what the text says explicitly as well as inferences drawn from the text.

Grades 9/10: 1. Cite evidence in the text that most strongly supports a specific analysis of what the text says explicitly as well as inferences drawn from the text.

Grades 11/12: 1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves things uncertain.

■ **Fair to Middling**

Except for the final clause in grades 11-12, these standards are all (unclearly written) paraphrases of the *first* CCRS for Reading (“Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text”). They show no increase in intellectual demand at all. Nor do they show any differences between a literary and a non-literary text. How can they? They are generic skills – “can do” kinds of statements – which can be applied at any grade to any text but in themselves entail no body of prior literary or world knowledge or content specificity to give them intellectual heft. They would gain cognitive power if they were accompanied through the grades by a designation of specific texts types, recognized historical periods, and/or texts with increasingly more difficult or complex ideational content and other features specific to non-literary texts, or with increasingly more complex themes and features specific to literary texts. These text types, recognized historical periods, and/or texts would need to show some formal and substantive connections to what had previously been assigned and to what would be assigned at a later date to establish the basis for an authentic curriculum or course of studies. But the general guidelines to such texts, text types, or authors (i.e., to a curriculum) clearly do not (and cannot) come from a content-empty and culture-free set of skills or processes.

Here is #2 in the Standards for Literature and Reading 6-12, lest readers think #1 is the only bad apple in the barrel.

For Literature:

Grade 6: 2. Analyze how a theme or central idea develops over the course of a text, drawing on key details.

Grade 7: 2. Analyze how two or more themes or central ideas in a text relate to one another, drawing on key details.

Grade 8: 2. Analyze how recurring images or events contribute to the development of a theme or central idea in a text.

Grades 9/10: 2. Analyze in detail the development and refinement of a theme or central idea in a text, including how it emerges and how it is shaped and refined by specific details.

Grades 11/12: 2. Analyze how multiple themes or central ideas in a text interact, build on, and, in some cases, conflict with one another.

For Reading:

Grade 6: 2. Analyze how a central idea develops over the course of a text, drawing on key details.

Grade 7: 2. Analyze how two or more central ideas in a text relate to one another, drawing on key details.

Grade 8: 2. Provide an objective summary of a text, accurately conveying an author’s view and specific points.

Grades 9/10: 2. Analyze in detail the development and refinement of a central idea in a text, including how it emerges and is shaped and refined by specific details.

Grades 11/12: 2. Analyze how multiple ideas in a text interact, build on, and, in some cases, conflict with one another.

Again, with just a few exceptions on details, almost all of these standards are paraphrases of the *second* CCRS for Reading (“Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas”). They, too, show almost no increase in intellectual demand through the grades. And except for the statements at grade 8 and the use of “theme” in the Literature standards, they show no real difference between literary and non-literary texts. Nor is their meaning very clear: e.g., how would sixth graders respond to a request to analyze how a theme “develops over the course of a text”? Teachers need an example showing exactly what each generic statement means when applied to a specific text at a specific grade level. What these grade-level standards strongly demonstrate is that a culture-free and

content-empty skill set cannot generate authentic academic standards across the grades and thus serve as a curriculum framework.

A tacit admission that the CCRS are incapable of generating a substantive curriculum framework is the placement of a sidebar on p. 31, the page listing the CCRS, on the importance of reading such high-quality texts as “the founding U.S. documents, the classics of American literature, and the timeless dramas of Shakespeare” and gaining a “reservoir of literary and cultural knowledge.” If reading such texts was that important, why wasn’t the content of the sidebar incorporated into the CCRS? Nor are there any links between the CCRS and the fine list of “illustrative” titles in Appendix B. This Appendix simply indicates a range of complexity across grade levels and major genres. In no way does it suggest to teachers how these works could be used to address the CCRS in the classroom, i.e., how they are related to any of the CCRS and, more important, to each other for the purpose of crafting a classroom or school curriculum. (*Many media commentators have mistakenly told the public that the titles in Appendix B are required.*) By putting most of the little content that is mentioned (see Section 7 below) into peripheral machinery (i.e., a sidebar and an appendix), Common Core clearly implies the inadequacy of its CCRS – and that their inadequacy was intended.

B. No Reliable and Valid Basis for Common Grade-Level Assessments or High School Exit Tests

The most serious deficiency of an organizing framework consisting of skills or processes is not its inability to generate progressively more difficult or complex grade-level academic standards and, hence, a framework for an academically substantive curriculum but the inability of the standards it produces to serve as a valid or reliable basis for common assessments from grade to grade. Grade-level standards generated by a set of skills and processes cannot serve as a reliable or valid basis for common

assessments because such a framework has no substantive anchor, no agreed-upon core content to deepen, extend, develop, or build on through the grades, especially at the secondary level. Nothing serves to guide “graduated” learning at successively higher grades. The generic skill remains the same (as p. 6 and p. 31 make clear) even after its application to many different content possibilities. Since there is nothing to connect idiosyncratically chosen content taught at any one grade to what was taught in an earlier grade or to what can be expected to be taught in the next grade, the result is, in effect, a continuation of the incoherent, happenstance curriculum we now have in ELA, precisely the central issue that should have been addressed, not exacerbated, by national standards for K-12.

We demonstrate the negative implications of a skills-governed ELA framework for common assessments using the proposed progression of content-rich standards presumably generated for grades 6-12 by CCRS #9: “Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.” The progression of the six grade-level standards, presented below, illustrates three key problems for common tests based on standards that “translate” a skill into “grade-appropriate terms:” (1) most of the content in these standards was not generated by the skill, (2) the content is highly arbitrary if not capricious, and (3) most of the standards are unrelated in authentic content and intellectual aim to each other.

For Literature:

Grade 6: 9. Analyze stories in the same genre (e.g., mysteries, adventure stories), comparing and contrasting their approaches to similar themes and topics.

Grade 7: 9. Analyze a specific case in which a modern work of fiction draws on patterns of events or character types found in traditional literature (e.g., the hero, the quest).

Grade 8: 9. Compare a fictional portrayal

■ **Fair to Middling**

of a time, place, or character to historical sources from the same period as a means of understanding how authors use or alter history.

Grades 9/10: 9. Analyze a wide range of nineteenth- and early-twentieth-century foundational works of American literature, comparing and contrasting approaches to similar ideas or themes in two or more texts from the same period.

Grades 11/12: 9. Analyze how an author draws on and transforms fictional source material in a specific work (e.g., how Shakespeare draws on a story from Ovid or how a later author draws on a play by Shakespeare).

The skill or process that these grade-level standards are presented as “building on,” or leading to, is the basic one of compare and contrast, purportedly by analyzing writers’ approaches to themes or topics. But, the skill is mostly misapplied here, and it is unlikely to be assessed if these grade-level standards are used.

The skill doesn’t apply to grade 7 (we are not given even a hint of what modern work of fiction could be used in grade 7), and in fact the exercise of this skill is not entailed by an assignment that would be appropriate only at the high school level—to show how contemporary authors draw on themes or characters in traditional literature. (This grade 7 standard jumbles two standards in the Massachusetts curriculum framework, one requiring the reading in the middle grades of traditional epic literature, and the other requiring the reading in the upper secondary grades of texts composed later in time showing the influence of earlier themes, characters, and events.)

The skill doesn’t apply to grade 8, which requires reading a broad swath of historical material contemporary to the text’s content or context (it is unclear which is intended), and, as the standard itself makes clear, is not about compare and contrast but about how authors use or alter history.

Nor is comparing and contrasting texts from the same period (the grades 9/10 standard) the usual approach to the study of American literature in the 19th and 20th century. (Nor is it clear why 17th and 18th century American literature was not included.) Skill #9 doesn’t apply to grades 11/12, either, which is not about comparing and contrasting, but about the inspirational sources for a writer’s work (which may or may not be in traditional literature).

Any assessment of the application of this basic skill using the grade-level standard as the basis for a test item would not produce a score that could be meaningfully compared from grade to grade for the use of the skill at any one grade or across grades. The intellectual objectives for each standard differ considerably, are not related to each other, and for the most part have little to do with compare and contrast as a skill or process.

To show better the deficiencies in a set of standards that were presumably generated by a skill, consider the developmental progression for a topic in Massachusetts’ curriculum framework that the progression of grade-level standards for Common Core standard #9 drew on so poorly.

General Standard 16: Myth, Traditional Narrative, and Classical Literature

Grades 5/6: Compare traditional literature from different cultures.

Grades 5/6: Identify common structures (magic helper, rule of three, transformation) and stylistic elements (hyperbole, refrain, simile) in traditional literature.

Grades 7/8: Identify conventions in epic tales (extended simile, the quest, the hero’s tasks, special weapons or clothing, helpers).

Grades 7/8: Identify and analyze similarities and differences in mythologies from different cultures (ideas of the afterlife, roles and characteristics of deities, types and purposes of myths).

Grades 9/10: Analyze the characters, structure,

and themes of classical Greek drama and epic poetry.

Grades 11/12: Analyze the influence of mythic, traditional, or classical literature on later literature and film.

Table 1 provides a broader picture of the effects on grade-level intellectual progressions of a

framework organized by a skill set. Table 1 also shows how Common Core’s March standards compare in their coverage of informational and literary reading to the best sets of state standards for ELA.³

As Table 1 shows, many progressions for literary study in the best sets of state standards for ELA are not in Common Core’s March draft.

Table 1: Developmental Progressions in English Language Arts Standards in Grades 6-8, from Grades 6-8 to Grades 9-10, and from Grades 9-10 to Grades 11-12 in Massachusetts, California, Texas, Indiana, and Common Core’s March 2010 draft.

Topic	Massachusetts 2001			California 1998			Texas 2008			Indiana 2000			Common Core March 2010			
	Grade:	6-8	9/10	11/12	6-8	9-10	11-12	6-8	9-10	11-12	6-8	9-10	11-12	6-8	9/10	11/12
Vocabulary		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dictionary skills		X	X	X	--	--	--	X	X	X	--	--	--	--	--	--
Figurative/rhetorical techniques		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Categories (e.g., idioms, foreign words)		X	X	X	X	X	X	X	X	X	X	X	--	--	--	--
Ways to use context		X	--	--	X	--	--	X	X	X	X	--	--	--	--	--
Nonfiction		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Purpose (position, perspective)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Structure of genre		X	X	X	X	X	X	X	X	X	X	X	*	*	*	*
Organization of content		X	X	X	X	X	X	X	X	X	--	X	--	X	X	X
Fiction		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Drama and drama-specific features		X	X	X	--	X	X	X	X	X	--	X	X	X	--	--
Traditional literature/mythology		X	X	X	--	--	X	X	X	X	--	X	X	--	--	--
Poetry and poetry-specific features		X	X	X	X	--	X	X	X	X	--	X	X	--	--	--
Subgenres		X	X	X	X	X	X	X	X	X	X	X	--	--	--	--
Theme		X	X	X	X	X	X	X	X	X	X	X	X	--	--	--
Point of view (narrator’s stance)		X	X	X	X	X	X	X	X	X	X	X	**	**	**	**
Characters/characterization		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Plot		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Setting/mood		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Lists of culturally/historically significant texts or authors		X	X	X	X	X	X	--	--	--	X	X	X	X	X	X
Major literary periods/traditions Specified		--	--	--	--	--	X	--	X	X	--	--	X	--	X	--
Historical/cultural connections		X	X	X	--	--	X	--	X	X	X	X	X	--	--	--
Literary/rhetorical criticism or Evaluation		--	--	--	X	X	X	X	X	X	X	X	--	--	--	X

*Structure and organization were conceptually mixed in the March draft, so credit was given for organization only, which seemed to be what structure referred to.

**Point of view, a literary element meaning narrator’s stance, was misconceived as perspective, position, or purpose in Core Standard #6 for literature, so credit was not given for it here, as a substitute for the literary element.

Deficiencies in its vocabulary standards (e.g., specific dictionary skills) can be remedied fairly easily, but not deficiencies in addressing key elements of some basic genres in literary study at the high school level. Developmental progressions for key features of drama, poetry, and traditional literature through the grades cannot be generated from the set of skills governing the grade-level standards.

What shows up visibly as a deficiency in *all* sets of ELA standards are developmental progressions in the secondary grades for specified literary periods, movements, and traditions and for historical and cultural connections—features of a secondary English curriculum that lead to an educated student of the English language and the literature showing its development. These are deficiencies that Common Core needs to provide in its next iteration of national grade-level and core standards.

Compared to the January draft, the March draft shows a modest beginning in this area and is to be commended for what it does provide. But the current number of content-rich literature and reading standards in grades 6-12 is not adequate or sufficient as an intellectual guide for these grades. Here are all four of them:

* Grade 9-10: Analyze a wide range of nineteenth- and early-twentieth-century foundational works of American literature, comparing and contrasting approaches to similar ideas or themes in two or more texts from the same period.

* Grades 11-12: Compare and contrast multiple interpretations of a drama or story (e.g., recorded or live productions), distinguishing how each version interprets the source text. (This includes at least one play by Shakespeare as well as one play by an American dramatist.)

* Grades 9-10: Analyze documents of historical and literary significance, including foundational U.S. documents (e.g., the Declaration of Independence, the Preamble to the Constitution, the Bill of Rights) for their premises, purposes, and structure.

* Grades 11-12: Analyze how various authors express different points of view on similar events or issues, assessing the authors' assumptions, use of evidence, and reasoning, including analyzing seminal U.S. documents (e.g., The Federalist, landmark U.S. Supreme Court majority opinions and dissents).

These four standards are based mainly on two standards in the fine set of high school exit standards for the English language arts in Achieve's American Diploma Project. Unfortunately, these content-rich standards are not placed among the ten CCRS that guide all of Common Core's ELA standards, where one might have expected them to appear.

C. An Unneeded “Complexity” Formula to Help English Teachers Judge the Complexity of the Literature They Teach

To guide teachers in the choice of texts for the classroom curriculum, Common Core provides a new readability formula. However, the formula developed by a University of Memphis group for Common Core (“Coh-Metrix” or CM) is unusable by the average teacher, and it is unlikely to be used by the able teacher for several reasons.

First, CM provides no easy-to-understand grade-level placement as its “score,” a major virtue of the Dale-Chall Readability Formula and others. CM has been constructed to show differences between easy and hard texts on five “key factors.” So far, it provides teachers only with percentile numbers on these factors ranging from 0% to 100%. However, these factors do not have consistent meanings. Texts high in “narrativity” and “cohesion” will have low percentiles, meaning they are easy. Texts low in “syntax” and “word abstractness,” meaning they are easy, will also have low percentiles. The chart in Appendix A on p. 10 eventually makes sense but not at first blush because the formula developers did not use category names with parallel neutral values.

Second, CM is not a substitute for a properly trained English teacher's judgment. In one of

several applications of CM in Appendix A to show its supposed usefulness, readers are given the percentiles for its five factors for an excerpt from *The Grapes of Wrath*. We are also given the results of applying two well-known formulas (Flesch-Kincaid and Lexile) to the excerpt, both of which place it at grades 2-3 in reading level. After describing the excerpt as “extremely easy” on the basis of most quantitative measures, Common Core correctly notes that “qualitative measures” (i.e., professional judgment) place it appropriately at grades 9-10. Clearly, that is all that was needed to begin with.

Third, CM’s percentiles are not necessarily readily interpretable. It is not at all clear what differences in the percentiles for these five key factors actually tell us. To show its usefulness for Steinbeck’s novel, Common Core claims that its recommended grade-level placement at grades 9-10 is reflected in the high percentiles on “sentence-level cohesion” and “overall text cohesion,” which it believes results from the “fact that Steinbeck makes relatively few explicit links among words, sentences, and ideas—something that will likely pose a challenge to student readers.” However, no evidence is presented showing that a paucity of explicit textual links in this novel or in others Steinbeck has written actually poses a challenge to high school students. In fact, a reading of the excerpt, which consists chiefly of dialogue, suggests what the text-level difficulty, if any, may be: the characters’ spoken dialect, which Steinbeck captured orthographically. This frequent feature of a novel—the spoken dialect used by its characters—which can pose a reading challenge (as any English teacher can tell us with respect to Zora Neale Hurston’s *Their Eyes Are Watching God*), does not appear to be captured by any of the five factors in CM.

No “complexity” formula can tell an English teacher a text’s literary context and literary history--what links it to earlier and contemporary texts. The nation’s English teachers do not need a “complexity” formula to judge the complexity of a literary text. Its very presence implies a

negative view of their competence.

It has always been clear to educators, parents, and others in any country that a progressively more challenging curriculum should include texts of greater and greater difficulty and complexity. Common Core’s explanation (in Appendix A) of why complexity matters and why the school curriculum has failed our students on this issue diagnose the problem correctly; textbooks have been continuously dumbed down for decades. But the solution is not to expect English teachers to use a complexity formula to help them judge what texts to teach at each grade level. They know (or should know) how to determine complexity better than any mechanical formula can. If they can’t, we need to inquire into their academic and professional education.

The problem of dumbed-down textbooks lies to a great extent with the advice educators gave teachers and publishers many years ago to address teachers’ inability to teach struggling students how to read grade-level materials. The fault does not lie with the publishers themselves. They were asked to reduce the reading level of their textbooks and to narrativize what had been expository texts on the grounds that narratives were easier to read (true), would engage struggling readers better (possibly), and would teach them what they couldn’t learn from expository texts (not true). After publishers and teachers followed their advice and regularly lowered the reading level of their textbooks, struggling readers still didn’t read better. Worse yet, all the other students were also learning less. Now educators have disingenuously concluded that students can’t read complex texts by grade 12 because their textbooks declined in complexity.

What remains unsolved—the original problem in the 1950s and 1960s—is how to help students who don’t like to read or who haven’t learned how to read very quickly to read “complex” texts. Nothing in these standards addresses the basic issue. We have simply moved in a full circle back to where we were in the 1950s and 1960s when

readability formulas were openly used to gauge the level of what should be in school textbooks—and their use regularly denounced by advocates of “authentic” literary texts for elementary schoolchildren.

Because of a seeming unwillingness to provide the substantive contours for a coherent and progressively more challenging literature curriculum in the secondary grades, Common Core has had to resort to an artificial mechanical device to link literary and non-literary texts to the standards generated by this content-empty and culture-free skill set. The device is a complexity formula, and the huge list of titles in Appendix B is presented as simply “illustrative” of different levels of complexity. The central problem for an English curriculum remains, however. A complexity formula cannot indicate (1) what makes a text the richest literary or non-literary text to study at a particular grade level or at a particular time in the school year, (2) a text’s relationship to other literary and non-literary texts, historical or contemporary, or (3) how to understand a text’s historical or cultural significance (i.e., the issues in developing a coherent curriculum). What is not at all clear is why this formula was developed and who will use it, given its many limitations.

D. Pedagogically Weak, if Not Useless, Vocabulary Standards in Grades 6-12

Since vocabulary knowledge is the chief component in reading comprehension, deficiencies in this “strand” have the most serious implications. The standards presented in the most crucial years (grades 6-12) imply only a contextual approach to vocabulary learning even though the research is clear about the benefits of some explicit vocabulary teaching. The pedagogical uselessness of what the March draft offers in this strand is a recipe for reading failure at the high school level, especially for students whose families are not highly literate in English. A major strength of all the versions of the Massachusetts ELA curriculum framework is the

spelling out of the different categories of words/concepts that teachers could explicitly teach through the grades, especially in high school (but not how to teach them). Even the use of dialect by a literary writer is an explicit standard to be taught in a strand on formal/informal English, a strand that does not exist in Common Core’s March draft.

Here is all that the empty College and Career Readiness Standards provide on p. 47:

“Determine the meaning of words and phrases encountered through conversations, reading, and media use.”

“Understand the nuances of and relationships among words.”

“Use grade-appropriate general academic vocabulary and domain-specific words and phrases purposefully acquired as well as gained through conversation and reading and responding to texts.”

There is not even a CCRS requiring the teaching and learning of dictionary skills (and there are many that need to be taught and learned, as spelled out in the Bay State’s own 2001 ELA curriculum framework for ELA). All we find on pp. 49 and 50, where “vocabulary acquisition and use” has been relegated and smothered by an anti-teaching approach, is “verify the preliminary determination of a word’s meaning (e.g., by checking the inferred meaning in context or looking up the word in a dictionary).”

Among other pedagogically useless standards are:

“Trace the network of uses and meanings that different words have and the interrelationships among those meanings and uses.” (One wonders how many teachers can interpret this “standard.”)

“Distinguish a word from other words with similar denotations but different connotations.” (It is not surprising that no examples were given to illuminate the meaning of this standard since it is pretentious gibberish.)

We do not know if these vocabulary standards were actually provided by the vocabulary experts listed by Common Core as reviewers or consultants. Whether or not they were, shouldn't we expect American students to learn, for example, the meaning of foreign words used frequently in written English, idioms, literary and historical allusions, proverbs, and adages, among the many categories of words that need to be brought explicitly to students' attention? Or, is the expectation to be: if you don't know what a word means, guess or look it up, if you can figure out how to do that? There isn't even a hint that discipline-specific technical vocabulary should be looked up in a glossary because the meaning of technical terms (especially in science and mathematics) usually cannot and should not be determined contextually.

E. A Misleading Reference to NAEP's Percentages for Passage Distribution on Reading Tests

The introduction to the K-12 standards seems to want to justify a stress on reading "informational texts" by referring to the "Distribution of Literary and Informational Passages in the 2009 NAEP Reading Framework" (p. 3). However, these percentages (70% for informational passages in high school; 30% for literary passages) are for NAEP's *reading assessments*, not the *ELA curriculum*. NAEP's percentages were not intended to guide the allotment of class time for the high school literature curriculum. NAEP's reading tests were intended by Congress to assess reading skills developed outside of school and in the other subjects taught in high school as well as the English class. Moreover, they do not assess drama at all because, NAEP claims, a coherent excerpt from a play would be too long for a test item (even though Massachusetts has regularly assessed excerpts from plays by recognized authors such as Shakespeare and Moliere on its ELA tests). Further, a report by Achieve noted very clearly that "literary text should remain the reading centerpiece of the English classroom," that the "NAEP reading assessment is not an

'English' test in the traditional sense," and that "if NAEP were an end-of-course English test, they would recommend a 50 percent or higher representation of literature" (Achieve, 2005, p. 21).

The introduction to the March draft ELA standards acknowledges the limitations of NAEP's percentages for guiding the allotment of time for literary study in the high school curriculum.

The NAEP framework also makes clear that significant reading of informational texts should take place outside of the ELA classroom in order for students to be ready for college and careers. The NAEP framework applies the sum of all the reading students do in a grade, not just their reading in the ELA context. The percentages do not imply, for example, that high school ELA teachers must teach 70 percent informational text; they demand instead that a great deal of reading should occur in other disciplines" (p. 3, also see p. 2 and elsewhere).

Nevertheless, Common Core has chosen to include standards for "literacy in history/social studies and science" in the title and documents for its English language arts standards, in a separate section for grades 6-12. And it explicitly notes that its grades 6-12 standards will require "much greater attention to literary nonfiction than has been traditional." Why did Common Core's March draft mention NAEP's percentages at all if it did not intend to place more stress on both literary non-fiction and informational reading than it thinks English teachers now give it? In other words, a reference to these percentages was unnecessary if English teachers are not to be expected to spend more time teaching informational reading. We do not yet know if and how the 70 percent figure for NAEP's reading assessments that Common Core is using to justify a stress on the reading of literary non-fiction and informational texts in the high school English curriculum will influence test specifications for the common assessments to be developed in the

English language arts. Will the high school exit test in ELA be just for English teachers? Or will all high school teachers be held accountable for the results of the non-literary items on ELA tests?

It remains to be seen what distribution of literary and informational passages the USED requires in grants to test developers for the common assessments to be based on Common Core standards. If we are to believe the March draft that NAEP's percentages "do not imply that high school ELA teachers must teach 70 percent informational text," then we should not see a 60/40 distribution or even a 50/50 distribution. In fact, we should expect to see NAEP's percentages almost reversed at the high school level for ELA tests—close to 70 percent for literary passages and 30% for informational passages—or a distribution that is much closer to what Massachusetts English teachers recommended in 1997 for the state's ELA tests. In 1997, they recommended about 60 percent literary and 40 percent informational passages at all grade levels, with 60 percent of the literary passages based on authors in Appendix A (a recommended list reflecting this nation's civic and literary heritage) and 40% of the literary passages based on authors in Appendix B (a recommended list reflecting contemporary authors in this country and elsewhere). At present, the distribution of illustrative titles in Appendix B at the high school level is ominous: 50 percent for fiction, drama, and poetry, and 50 percent for anything else. That is not appropriate for the high school English curriculum.

F. No International Benchmarking

British Columbia's high school exit test and required readings⁴ and Finnish requirements in its upper secondary schools⁵ clearly indicate that Common Core's ELA College- and Career-Readiness Standards and its grade-level standards are not benchmarked internationally.

G. Concluding Comments and Caveats

Although Common Core has made considerable progress in addressing the deficiencies in the January draft of its grade-level standards, much more work remains to make its ELA standards as good as, if not better than, those in the top-rated states in this country (California, Indiana, Massachusetts, and Texas) and to make its ELA standards competitive with other countries that have rigorous expectations in language and literature for determining college readiness in their high school population. The most serious problem with Common Core's ELA standards remains its organizational scheme. A set of generic, content-free, and culture-free skills do not serve as the basis for generating grade-level academic standards, especially at the high school level, and as the basis for reliable and valid common assessments. Until the damaging limitations of the current organizing scheme are better understood and an academically sound organizing scheme is used, Common Core's draft writers will not be able to generate developmental progressions of academically sound and coherent grade-level and high school exit standards that lead to common curricular expectations through the grades. Nor will they be able to assure the states that common assessments based on the kind of standards we see in the March draft will lead to valid and reliable assessments of student learning.

Recommendations

For Mathematics

1. Address the slow pacing of the development of basic skills in arithmetic by requiring near mastery of multiplication and basic skills with long division by the end of grade 4. At worst, our grade 4 expectations should be comparable with Singapore's grade 3 expectations, shown below.

*build up the multiplication tables of 6, 7, 8 and 9 and commit to memory

*use of the terms product, quotient and remainder

- *multiplication and division within the multiplication tables

- *division with remainder,

- *multiplication and division of numbers up to 3 digits by 1 digit

- *solve up to 2-step word problems involving the 4 operations

2. Introduce core pre-algebra skills in the early grades and continue to develop them, thus following what the top state standards and high-achieving countries do.

3. Revise the approach to geometry in middle and high school to reflect proven programs and approaches. While it may be useful for students to have experience with translations, rotations, reflections, and dilations, the full understanding of plane geometry should not depend on these experiences.

4. Present concepts such as the associative law, commutative law, and distributive law in an age-appropriate way and do not present advanced university-level discussions for elementary school material.

5. Revise and reorder the high school material but do not weaken the overall mathematics content that all students receive in high school. In high-achieving countries, typically over 90 percent of the population graduates from high school and calculus is a high school graduation requirement.

For the English Language Arts

1. Remove the ten culture-free and content-empty College- and Career-Readiness Standards for Reading listed on p. 6 and p. 31 of the March draft. They serve no academically constructive role. They should be replaced by standard D and its subsidiary standards in Conley's 2003 list and by the first two standards in Achieve's American Diploma Project's high school exit test for ELA. These standards can serve to generate many academically substantive and coherent grade-level standards from grades 6 to 12.

2. Remove material on the "complexity" formula, both in the grade-level standards and in the appendix. This formula cannot easily be used by elementary teachers, won't be used by appropriately educated English teachers, and is inappropriate to include in a standards document.

3. Completely revise the vocabulary strand in grades 6-12 and remove the pedagogically weak or useless standards. Common Core's draft writers could adopt the vocabulary strand in California's 1998 standards or the vocabulary strand in Massachusetts's ELA curriculum framework, which Massachusetts teachers have found useful for classroom instruction in the past ten years. The Bay State's Department of Education staff worked out an even richer sequence of academic standards for vocabulary teaching/learning in the November 2009 draft revision, and the nation as a whole would benefit from having such standards.

4. Remove all the "literacy standards for history/social studies and science" from future drafts for ELA unless English teachers are given sufficient scholarly information on the historical context and political significance of the many fine historical documents listed in the March ELA draft for teaching students how to understand them.

5. Aim for an appropriate balance of secondary-level reading and writing standards that makes sense to English teachers, strengthens the secondary English curriculum, and prepares all students for college. The March draft has 9 standards for literary reading and 10 for informational reading, an almost equal weighting that leads to an unbalanced high school English curriculum. The draft also divides composition into three equal sets of standards: one for narrative writing, another for argumentative or opinion-based writing, and the third for informational or explanatory writing, an equal weighting that leads to a lack of balance through the grades. To make sense to English teachers, about 60 percent of the reading standards should

address literary reading, and about 40 percent should address informational reading. To prepare all students appropriately for college, the bulk of student writing in the secondary grades should be analytical writing, to compensate for the inordinate stress on experience-based narrative writing in K-8.

About the Authors:

R. James Milgram is Professor of Mathematics, Emeritus, at Stanford University, and a member of the Common Core Validation Committee.

Sandra Stotsky is a member of the Massachusetts Board of Elementary and Secondary Education. She is also Professor of Education Reform at the University of Arkansas where she holds the 21st Century Chair in Teacher Quality. She is a member of the Common Core Validation Committee.

About Pioneer:

Pioneer Institute is an independent, non-partisan, privately funded research organization that seeks to change the intellectual climate in the Commonwealth by supporting scholarship that challenges the “conventional wisdom” on Massachusetts public policy issues.

Recent Pioneer Publications

Why Race to the Middle?, White Paper, February 2010

Failure to Thrive: Job Creation and Loss in Massachusetts: 1990-2007, White Paper, January 2010

An Interim Report Card on Massachusetts Health Care Reform, White Paper, January 2010

Debunking the Myths About Charter Public Schools, Policy Brief, January 2010

Drawing Lessons: Different Results from State Health Insurance Exchanges, Policy Brief, December 2009

Closing Springfield’s Achievement Gap: Innovative Ways to Use MCAS Data to Drive School Reform, Policy Brief, October 2009

School-Based Management: A Practical Path to School District Reform, Policy Brief, September 2009

Driving the New Urban Agenda: Desired Outcomes for the Middle Cities Initiative, July 2009

Endnotes

1. Clifford Adelman. (2002). *The Toolbox Revisited*, U.S. Department of Education. p.31
2. David Conley. (2003). *Understanding University Success: A report from Standards for Success*, a project of the Association of American Universities and the Pew Charitable Trusts. University of Oregon: Center for Educational Policy Research.
3. For this comparison, or crosswalk, the secondary standards were divided into three groups, those for grades 6, 7, and 8, those for grades 9 and 10 (for Massachusetts and Common Core identical), and for grades 11 and 12 (for Massachusetts and Common Core identical). To get credit for a developmental progression in each of the three grade spans, the standards needed to show an increase in the level of difficulty or complexity for the topic listed in the left-hand column—from grade 6 to grade 8, and then from grade 8 to grades 9 and 10, and then to grades 11 and 12. The progression didn't need to take place in one section of a document; that is, related standards counted if they were in different parts of the document (as was the case for the different kinds of literary or rhetorical techniques).
4. Common Core. (2009). *Why We're Behind: What Top Nations Teach Their Students But We Don't*. Washington, D.C.: Common Core. pp. 25-33.
5. See the Appendix in Ze'ev Wurman & Sandra Stotsky. (February 2010). *Why Race to the Middle?* Boston: Pioneer Institute.

Appendix:
Written Testimony sent to the New Jersey Board of Education
Read at the March 17, 2010 Meeting

PRINCETON UNIVERSITY

Department of English
McCosh 22
Princeton, New Jersey 08544-1016

I and my colleagues at the Association of Literary Scholars, Critics, and Writers have read through the March 2010 public comment draft of the proposed English language arts standards. We are pleased to see literary and cultural knowledge specified in several grade-level standards at the high-school level, and we note with appreciation the strong statements, in the sidebar on p. 31, about the importance of this knowledge. A study of the literary history and literary context for the many culturally significant “illustrative” titles in Appendix B is vital for future generations of American students.

At the same time, we are disappointed to see nothing in the “college-and career-readiness standards” (p. 31) that serves to frame cumulative, graduated learning in literary history, traditions, forms, styles, and significant writers. These standards, not the sidebar, will be the basis for common assessments, and we question the indication of the draft-writers that “college readiness” can be achieved by content-free standards. The contingent content for exercising elementary interpretive and paraphrasing skills in these standards is not adequate. Any other subject would have graduated content, but the drafters of these standards imagine that “college readiness” can be content-free when it comes to “literature.”

We cannot endorse the absence of content-rich literary standards in “college readiness” any more than we can endorse just a sporadic and infrequent inclusion in the grade-level standards. This absence in this public-comment draft reflects what seems to us to have been a nearly systematic exclusion of those with expertise in literary study in the development of the standards. No one with expertise in the study of literature as a subject in itself was appointed to the standards-development committees, and those who attended the open forum last December, and then again in February, reported that they were given no way to argue a case that had seemed to have been pre-decided. We are surprised and concerned that the media have failed to note the exclusion of literary study from what are deemed “college readiness” standards. Without graduated, substantive content, adequate preparation for college study in any subject would be seriously compromised. Although there is nothing positive to object to in the statement of standards, we lament the absence of literary study in a necessary, valuable, and vital distinction from “language arts.”

Yours sincerely,

Susan J. Wolfson
Professor of English
Princeton University

President, Association of Literary Scholars, Critics, and Writers

