

Where's the Math?

Statement on Common Core State Standards for Mathematics

August 11, 2010

Washington State is poised to formally adopt a set of nationally developed education guidelines, the Common Core State Standards (CCSS) for reading, writing, and mathematics. These standards will replace Washington's existing locally-developed standards but allow up to 15% addition of state-specific content.

Where's The Math? (WTM) has taken an active role over the last five years in advocating for rigorous, coherent, and internationally competitive mathematics education for all of Washington's students. More recently, WTM members have volunteered hundreds of hours to review the CCSS documents and compare these national standards against the new mathematics standards Washington adopted in 2008. This work has provided the basis for this statement.

Where's the Math? does not support the adoption of the Common Core State Standards for Mathematics.

- Washington's current math standards are clearer, more detailed and explicit, and more coherent. WA standards are rigorous with critical content well prioritized, and were given an "A" rating in 2010 by the Fordham Foundation, exceeding the CCSS rating of "A-"⁽¹⁾
- These standards will not align with Washington's current textbook recommendations, recently purchased and implemented by many districts statewide.⁽²⁾
- The financial cost and momentum lost to implement these new standards is not justified, especially in light of the continuing rollout and training underway with Washington's 2008 math standards.^{(3) (4)}

The detailed study completed by WTM experts identified the following deficiencies with the CCSS mathematics standards.

- These standards are not internationally benchmarked and delay development of some key concepts and skills compared to the highest achieving nations.
- These standards are not stakeholder friendly. They include significant mathematical sophistication, but are written at a level beyond the understanding of most parents, students, administrators, decision makers and many teachers.
- The lack of clarity, specificity, and coherence will lead to a lack of uniformity in instruction and assessment.
- The inappropriate placement of standards, including the delayed requirement for standard algorithms, will hinder student success and waste valuable instructional time.
- The uneven treatment of important topics will result in an inefficient use of instructional and practice time with too much effort devoted to some topics and not enough time devoted to others.
- The high school standards are not well organized and some important topics are insufficiently covered. The standards have not been divided into clearly defined courses.

(1) Washington State's math standards receive an "A" grade, higher than the CCSS math standards. http://www.edexcellence.net/index.cfm/news_the-state-of-state-standards-and-the-common-core-in-2010

(2) In 2008, over 50% of Washington districts planned to adopt new mathematics instructional materials in the next 2 years. <http://www.k12.wa.us/LegisGov/2008documents/SchoolDistrictMathCurriculaAdoptionandUsage-FINAL.pdf>

(3) Starting with the 2009-10 school year, Washington's recently adopted standards will be in use for K-9, Alg1, & Int1. <https://www.k12.wa.us/mathematics/Standards.aspx>

(4) OSPI's 2007-2009 Biennial budget includes over \$50M to support the development and adoption of new math/science standards. This cost does not include assessment costs, textbook adoptions or specialized professional development expenses for local school districts. <http://leap.leg.wa.gov/leap/budget/lbns/2007ps.pdf> (Pg 304)

Where's The Math? (WTM) is a statewide math advocacy group comprised of concerned citizens seeking a balanced and rigorous mathematics education for Washington's kids. Our mission is to ensure that all Washington State students have an equal opportunity to compete successfully in the international economy by aligning our state math standards, assessments and curricula to those of top performing nations in the world. WTM chapters are organized across the state, with members volunteering in schools, on local PTAs, as elected school board directors, and lobbying elected officials to make Washington the mathematics role model for the country.

Where's the Math?

Comments on A Comparative Match Up of the CCSS and WA State Math Standards K-8

August 11, 2010

There are over 317 standards in the K-8 Common Core mathematics standards. This compares to about 245 for WA. Of these 317 there are 128 with no clear match to a WA standard. Bringing our schools' curricula, training, and assessment in line with the CCSS will be a very large and expensive job.

Standards should be clearly written and accessible to teachers, parents, and even the students themselves. The Common Core standards are written in a style that may be very clear to mathematicians, but will be seen as opaque and confusing to most elementary teachers, and many high school teachers as well. Standards that cannot be clearly understood will not receive the emphasis intended by those that wrote them.

Only a handful of the Common Core standards map neatly to corresponding Washington standards. A rare example:

WA 2.3.B – Estimate length using metric and U.S. customary units.

CCSS 2.MD.3 – Estimate lengths using units of inches, feet, centimeters, and meters.

More typical is the following example from fourth grade, where a simple idea is convoluted unnecessarily.

WA 4.1.D – Multiply by 10, 100, and 1,000.

CCSS 5.NBT.2 - Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the *placement of the decimal point* when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

Many standards that have no match among the existing WA standards are even more difficult to read, for example:

CCSS 4.OA.2 – Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.

How this will be manifest in a lesson plan, a set of problems, or an assessment, is difficult to predict. While all text publishers will readily and enthusiastically claim that their product “aligns” to the CCSS, just what that means to teachers, their parents, and most importantly, the students is likely to be inconsistent from district to district, school to school, and from class to class.

Standards should not be written for a “priest class”, nor should they be so impenetrable as to allow careless interpretation.

Where's the Math?

Comments on A Comparative Match Up of the CCSS and WA State High School Math Standards

August 9, 2010

There are approximately 190 standards in the Common Core high school mathematics standards which include approximately 60 standards that would define a Pre Calculus course. The Washington math standards do not include Pre Calculus in the 118 standards that are listed. For comparison purposes we considered only the standards in Algebra I, Geometry, Algebra II, and Statistics. The CCSS contains 130 standards that would be found in these courses compared to 118 that are found in the Washington standards. Of the 118 Washington standards we found 50 standards that had no match in the CCSS. This means that approximately 68 of the 130 CCSS standards had a match in the Washington state standards.

Course Descriptions – The CCSS standards are listed in strands and have not been divided into specific courses. Without having the courses defined it is impossible to ensure uniformity, one of the stated purposes of the CCSS. In order to facilitate the matching of standards and to verify that viable courses could be extracted from the CCSS, WTM assigned each of the CCSS standards to Algebra I, Geometry, Algebra II, or Pre Calculus.

Algebra I – 26 matches out of 40 Washington standards. The CCSS standards make assumptions about prior knowledge that are not made in the WA standards. The CCSS standards are written in mathematically complex language which may be difficult for many stakeholders to understand.

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| A1.3.A | Determine whether a relationship is a function and identify the domain, range, roots, and independent and dependent variables. | F-IF.1 (also see 8.F.1 and 8.F.2) | Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x . The graph of f is the graph of the equation $y = f(x)$. |
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Geometry – 21 matches out of 43 Washington standards. The standards in this course are the least compatible. The CCSS Standards for Geometry also include proofs by rigid motion, a concept not found in most Geometry books. It is doubtful that a common textbook could be used for the courses described by these two sets of standards.

Algebra II – 21 matches out of 35 WA standards. Again, one is struck by the complexity of the matching CCSS standards. The comparison of these two sets of standards is made difficult because of the mathematical language in the CCSS standards as contrasted with the simplicity of language in the WA standards. It is further complicated by the vast difference in the granularity of the standards thus there are few exact matches.

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| A2.2.C | Add, subtract, multiply, divide, and simplify rational and more general algebraic expressions. | A-APR.1 | Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. |
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