



Wisconsin Mathematics Council, Inc.
Leading Quality Mathematics Education in Wisconsin

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WMC feedback
to CCSSO on
public release
of standards

Greetings:

Thank you for the opportunity to provide feedback to the March draft of the Common Core State Standards. The Wisconsin Mathematics Council (WMC) is an affiliate of the National Council of Teachers of Mathematics and leader in mathematics education across the Wisconsin. The attached comments reflect the perspectives of the Wisconsin Mathematics Council Board of Directors.

In this important time in mathematics education, WMC welcomes the opportunity to partner with CCSSO in the further development of the Common Core State Standards, as well as the implementation strategies, assessment tools, and professional development that are critical components of the next phase. As a statewide leader in mathematics education, we bring both a passion and a desire to be involved in future endeavors.

We look forward to future collaboration.

Sincerely,

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The Wisconsin Mathematics Council (WMC), an Affiliate of the National Council of Teachers of Mathematics, applauds the efforts of the standards writing teams as they attempt to articulate the important mathematics that students must learn. The Mathematical Practices have the potential to be an organizing structure around K-12 learning. We agree with the introductory statements about stressing conceptual understanding and revisiting organizing principles. However, the current document does not fully reach those goals and there are some components of the standards that are either designated too early or are missing from the March 2010 Draft of the Common Core Standards.

The ensuing comments reflect the perspectives and reactions of the WMC Board of Directors to the March 2010 Draft of the Common Core State Standards (CCSS) for Mathematics.

- **Standards must identify the important big ideas of mathematics.** Teachers welcome standards that clearly delineate the important 'big ideas' of mathematics. However, as teachers reviewed the draft CCSS the first thing they noticed was a long list of paper and pencil skills that will easily become a checklist of things to do. This results in students memorizing procedures rather than being able to learn and apply mathematics. The big ideas of geometry, especially at the elementary level, are not well connected. As you look across the geometry standards, they appear to be a series of discrete, unrelated activities.
- **There must be coherence between grades and across grade bands (grades K-5 to grades 6-8 to high school).** The current document shows how a topic builds across a given grade band (e.g. grades K-5); however, there is little continuity across the K-12 spectrum. We suggest that a K-12 coherence could be more readily achieved if the standards were aligned in three K-12 areas:
 - Number and Algebra
 - Measurement, Data, Statistics, and Probability
 - GeometryBy describing a K-12 picture of mathematics, teachers and students are able to clearly see how learning at their particular grade level either builds a foundation for subsequent mathematics or builds upon the learning that has been previously acquired. This is a critical component of a coherent curriculum.
- **The standards must be developmentally appropriate in order to ensure that students are ready to learn with understanding** otherwise they become a checklist of procedures that are memorized with little or no understanding. We are concerned that the consequence of designating standards before students are developmentally ready will impede student learning and will result in misconceptions that could have been avoided. This is particularly concerning at the primary grades (K-2) in place value, base 10, and computation. This is also a concern at the middle school level where algebra appears to be the primary focus of eighth grade.
- **There must be clear connection between the Standards for Mathematical Practice and the Grade Level Standards.** The practice or "doing" of mathematics needs to be integrated with the mathematics topics that our students should be learning. In order to ensure that this occurs, the Mathematical Practices need to be explained in grade level narratives and combined, where appropriate, with the skills and understandings in the grade level standards. We also suggest that

specific examples applicable to each level (K-5, 6-8, and high school) be included in each of the Standards for Mathematical Practice at the beginning of the document.

- **The focus on paper/pencil computation and using the standard algorithm has the potential of short circuiting student understanding.** Using multiple strategies and reasoning is an important component of the end goal that students know how to select and use efficient strategies to compute. They need to be able to choose from among strategies given the context of the problem. The standard subtraction algorithm (with regrouping) is certainly not efficient for some problems (e.g. 3000-2997). Students need to understand the importance of looking at the relationships between numbers. They need to understand what they are computing, not just memorizing a procedure. 'The' standard algorithm can cause a lack of understanding in the traditional manner in which many students have learned how to divide with fractions by invert and multiply (e.g. $\frac{7}{8} \div \frac{1}{4} = \frac{7}{8} \times \frac{4}{1}$), while having no understanding of why the answer must be between 3 and 4. Many adults are still confused why dividing by a fraction yields a larger number than the dividend.
- **Mathematical modeling, problem solving and applications need to be explicit and infused across all grade levels.** These areas are the essence of doing mathematics and, in the current version of the CCSS, are missing. The description of the Modeling category for high school is very strong; however the current format, in which there are no explicit modeling standards, but only connections to modeling across other categories, has the potential for modeling to be reduced in practice to two or three "applications" problems at the end of a unit or chapter. (In general we ask the writing group to consider the effect of the final document on commercial textbook publishers: will it push them to produce materials which present mathematics as a coherent subject, with a significant proportion of high-cognitive-demand tasks, or will they simply be able to cut-and-paste from current editions and claim they are aligned to the Common Core?)
- **Other areas of concern:**
 - No clear connection between mathematical topics or between mathematics and other disciplines
 - Very little attention to communication – writing, speaking, reflecting.
 - Little or no reference to the use of the "tools of mathematics" (except in the mathematical practices)– this includes manipulatives, measuring tools, technology, as well as paper/pencil.
 - Weak references to number sense, estimation and determining the reasonableness of solutions.
 - The extensive list of topics, especially at grades 9-12 will lead to breadth, not depth – continuing the dilemma of the "mile wide and inch deep" teaching of mathematics.
 - Insufficient attention to the infusion of mathematical processes, K-12 (problem solving, reasoning and proof, connections, representation, communication)
 - Appendix A reads like a table of contents for a textbook, and should not be a component of the Common Core Standards for Mathematics. There is a concern that it will result in publication of mathematics textbooks that reflect isolated topics.

The Wisconsin Mathematics Council agrees that focus and consistency nationwide could benefit mathematics education and that it is important for students to leave our K-12 schools with a firm grasp of key mathematical skills; however, WMC has concerns that much of the March 2010 draft of the Common Core State Standards seems to be a movement away from understanding and applying mathematics and toward more of an arithmetic-focused curriculum.

As a leader in mathematics education, the Wisconsin Mathematics Council welcomes the opportunity to partner on a national level with CCSSO and other organizations in the further development and review of the Common Core State Standards, as well as planning for and carrying out implementation strategies, assessment tools, and professional development.