



www.cpm.org

CPM Educational Program
A California Non-profit Corporation
1233 Noonan Drive
Sacramento, CA 95822
(916) 391-3301 (phone/fax) email: cpm@cpm.org

An Exemplary Mathematics Program
--U.S. Dept. of Education

Response to the PARCC Model Content Framework for Mathematics

Thank you for the opportunity to submit a response to the *PARCC Draft Model Framework for Mathematics*. The points below reflect the consensus of the College Preparatory Mathematics (CPM) Educational Program Executive Committee (Directors) and the editors of the CPM curriculum. The focus here is high school CCSS-M. Overall, the description of the intended outcomes of curricula based on CCSS-M is well done. In particular, the descriptions of how the mathematical practices work with the content of the courses will be quite helpful as the country begins a transition to teaching a complete, multi-faceted mathematics course of study. Nonetheless, there are several serious issues raised or not sufficiently addressed in the Framework.

CPM's first and most important concern is that there is still no definitive cluster of content for each of the high school courses. For the past 14 months, Achieve's Appendix A has been the only national document to address the distribution of high school content and has become the *de facto* standard. In the absence of any other outlines, Indiana, for example, conducted an official adoption process last November and the review of the high school courses was based on Appendix A. Publishers have created materials to provide "CCSS-aligned" high school courses based on that model. Publishers, including CPM, have materials in production based on that model. Given the goal of having materials ready sooner rather than later to give students and teachers time to transition to the expanded expectations of the CCSS-M curriculum, the issue of what material will be included in which courses needs to be settled now.

CPM believes that any content framework for high school needs to be substantially that of Appendix A, since it has been the model in use for more than a year and because it meets the goal of a more rigorous program of study for America's students. Adding or deleting a topic from a curriculum is not a matter of adding or deleting a single section in a chapter. A curriculum that embeds the mathematical practices in each of its lessons takes considerable time and care to develop. "Storylines" for the major concepts must be mapped out, then all of the related ideas threaded through the development of the main ideas. Writing the materials that make explicit connections between and among the ideas takes additional time to do well. Once these materials are developed, time is needed to field test them with teachers and classrooms of students.

CPM's second concern is related to the first. Our review of the content outlines of Algebra 1, Geometry and Algebra 2 as presented in the Model Content Framework does not find the challenging, stepped-up mathematics reflected in Appendix A. For example, completing the majority of the work with linear algebra in 8th grade opens Algebra 1 to extended work with functions by explicitly adding the study of functions beyond linear and quadratic. While some work to deepen students' understanding of linear functions is appropriate in Algebra 1 (after teaching these ideas in 8th grade), the framework's reference to merely introducing students to other functions beyond linear and quadratic is inadequate. Likewise, moving sequences to this course works well with the study of functions and frees time for more depth with the Algebra 2 topics listed in Appendix A. Unfortunately, other than the addition of topics in statistics and probability, we find the curriculum outline for the three core high school courses to be essentially equivalent to what exists today. We need to do more, especially if we want to take the various STEM initiatives seriously.

CPM's third concern is the repeated references to fluency in the context of substantial practice. We completely agree that there needs to be a balance of conceptual development and work with ideas to become proficient with them. But one of the core tenets of the CPM curriculum (and one leg of its research base and success for the past 20 years) is that students come to master the most important ideas over time: months, not days. We applaud the remarks in the Framework that point out that fluency may come over the span of two or more courses, but many additional comments seem to contradict this view. In particular there are such frequent references to "sufficient thoughtful practice" and "fast and accurate" that too many teachers can reasonably conclude that worksheets and drill are still the order of the day.

Finally, while CPM finds the descriptions of the mathematical practices in the introduction quite good, there is still little that is concrete to help the education community see what this will mean, especially with respect to assessment. Furthermore, CPM believes that there is much work yet to be done to create a mathematical framework for high school courses that meets the intent of the CCSS-M, and that this needs to be completed soon. Rigor and stepped up challenges for America's students as described in the original CCSS-M documents must be preserved. The elements of the mathematical practices need equal status with content in all aspects of the curriculum and assessment.

Respectfully submitted by:

Lori Hamada
President
Fresno, CA

Brian F. Hoey
Executive Director
Sacramento, CA

G. Thomas Sallee, Ph.D.
Chairman of the Board
University of California, Davis

Leslie Dietiker
Director of Curriculum
Michigan State University

Judith Kysh, Ph.D.
Vice-President
San Francisco State University

Michael Kassarian
Managing Editor
Dallas, TX