Response for *Connected Mathematics Project* (CMP3), Grades 6–8

Based on our review of EdReports' evaluations of *Connected Mathematics Project* (CMP3)*,* a comprehensive middle grades mathematics program, we - both the CMP authorship team and Pearson - believe that the conclusions of the EdReports reflect a very narrow interpretation of the goals of the Common Core State Standards for Mathematics (CCSS-M) and fall short of the true intent of the standards.

In evaluating instructional materials, it is important for evaluators, at any level, to keep in mind that standards do not dictate a curriculum, nor do they define a learning progression. In fact, the writers clearly state in the introduction to the CCSS-M that the standards "do not dictate curriculum" (p. 5). The role and purpose of any set of standards is to *guide* curricula by providing benchmarks for learning. Further, we believe that these standards should represent the *floor,* and not the *ceiling* in terms of expectations for student learning so that students are always encouraged to set and achieve higher goals and expectations.

An effective curriculum requires a carefully laid-out and thoughtful learning progression that often involves concepts that may not be specifically articulated in the standards, but, without exposure to these concepts, students may not achieve the expected proficiency with certain standards. Again, the writers of the CCSS-M acknowledge the difference between standards and curriculum:

> ...a teacher might prefer to teach a topic of his or her own choosing that leads, as a byproduct, to students reaching the standards for topics A and B. (CCSS-M, p. 5)

So while a curriculum may be guided by standards, it should not be limited to the standards. It should offer learning activities that engage students and challenge them to think deeply about concepts while providing adequate time for them to develop understanding and eventually demonstrate proficiency with the standards.

In developing *Connected Mathematics Project,* the authors drew from a comprehensive study of mathematics teaching and learning and extensive field work to identify best practices that would support students in their development of deep conceptual understanding and proficiency with problem solving, while still attending to computational fluency -- goals that pre-date, but are consistent with the CCSS-M.

A Focused Curriculum

The result of over 25 years of study and development, *Connected Mathematics* is defined in part by a *focused* pathway towards important mathematics including number, proportional

reasoning, and algebra and functions. In developing the program, the authors identified and sequenced key mathematical concepts that help students build a strong foundation for student learning. These concepts -- foreshadowing the idea of major work that the two assessment consortia have put forth -- represent the majority of mathematical study in the program. Moreover, these key mathematical ideas also frame and support the work students do in other units.

In their evaluation of the program, the EdReports reviewers applied very narrow standards for measuring focus that we believe compromises the intent of the CCSS-M with regard to instructional materials. At each grade level, the reviewers evaluated the program as not spending "the majority of class time on the major clusters." In the absence of insights into how the reviewers quantified sessions into different categories, we believe that such attempts to do so are misguided as they force each lesson into a single category, disregarding and discounting the interconnectedness of these rich learning activities in which students interact with concepts from different clusters, especially those that are essential to build that algebraic foundation.

Further, as we stated earlier, we believe that the intent of the writers of the CCSS-M was not to set restrictive upper bounds for what students should study at a given grade level. Rather, we believe that, in many instances, it makes good pedagogical sense to give students early informal introductions to big ideas like percent, similarity, and functions. So when some topics in *CMP3* are introduced prior to their prescribed grade placement in CCSS-M, there is strong pedagogical justification.

For example, EdReports evaluators noted as off-grade-level, and therefore misplaced in the curriculum, a Grade 7 unit that touches on similarity. In fact, the CCSS-M call for seventh grade work in scale drawing - a topic that is fundamentally about similarity of figures. An even stronger rationale for introducing similarity in grade seven is presented by Dr. Jim Fey, one of the *CMP* authors.

> The *Stretching and Shrinking* unit is included in the Grade 7 materials because extensive experience from prior research and development work has shown that similarity is a powerful visual representation and application of ratios and proportions. Students are introduced to this geometric topic as much to enhance their understanding of proportional reasoning as to help them develop early understanding of similarity. This supposedly premature introduction of similarity also pays dividends in subsequent units on measurement—the effect of proportional scaling on perimeters, areas, and volumes is an extremely important overarching measurement idea.

With regard to the EdReports evaluators' comments about the high school standards that are addressed in the Grade 8 materials, these materials were explicitly designed and developed to include all topics necessary to meet the CCSS-M for both Grade 8 mathematics and Algebra I, so that schools and teachers who want to use *CMP3* materials for an Algebra I

course can do so. The teacher support materials provide clear guidance on which units to teach for the Grade 8 course.

A Coherent Curriculum

The *CMP* program was also designed around a *coherent* organization of content with explicit and embedded connections both from grade to grade and within the different mathematical domains in each grade. The units across grades represent a strong, logical vertical progression of concepts and skills. Within a grade level, students encounter and apply key concepts from unit to unit in different areas of mathematics (e.g., measurement, geometry), highlighting the interrelatedness of these concepts and the powerful connections among concepts in different domains.

In their evaluation of the program for coherence, the EdReports reviewers note the strong coherence of the program, yet still evaluate the program as only partially meeting the expectations. Specifically, the reviewers noted a strong conceptual development across grade levels for Expressions and Equations, Ratios and Proportionality, and Number System, and stated, “Connections are evident in all grade levels and in all units. This is a very strong aspect of Connected Mathematics 3.”

A Curriculum Built Around Math Practices

An equally, if not even more, important aspect of the program is how students learn mathematics. In *CMP*, students’ development of mathematical concepts is grounded in and fostered by practices that many have come to know as the Standards for Mathematical Practices. Students come to understand important mathematical concepts by engaging in activities that require them to make sense of a problem, reason about solution pathways and eventually their solutions, communicate with peers about their thinking, and often explain and defend their solution pathways.

This approach has been so powerful that many math educators consider the program a hallmark of effective instruction on these habits of mind. It embodies the pathway to fluency that the CCSS-M promotes: one that focuses on initial conceptual understandings and moves toward fluency with both basic facts and access to and use of the standard algorithm.

In addition to its focus and coherence, one of its most recognized strengths are the thinking and reasoning habits that were the foundation of the Standards for Mathematical Practices.

Because *CMP3* was evaluated as not meeting expectations for focus and coherence, it did not undergo the complete evaluation, which in the spirit of a “Consumer Reports” of instructional materials, would have allowed for a comprehensive assessment of the strengths and weaknesses of the program.

A Dynamic and Evolving Curriculum

The *Connected Mathematics* curriculum design and instructional materials for both students and teachers are the result of 25 years of implementation, study, and consultation with master teachers, curriculum developers, mathematicians, and mathematics education researchers. Results of extensive research into use of *Connected Mathematics* show consistent, positive effects on student conceptual understanding and problem solving ability without sacrificing achievement in computational fluency.

The current third edition of *Connected Mathematics* was carefully constructed to reflect new expectations of the full set of CCSS-M. It underwent the same rigorous development process that is a hallmark of the program. We believe the proven record of *Connected Mathematics* with its focused and coherent curriculum and the consistent efficacy results provide clear evidence that *CMP3* offers a program and pedagogy designed to help students become proficient mathematical problem solvers.