

Response to Proposed Math Standards in Minnesota

This document is an attempt to express concern over what would be a very poor possible outcome of the work being proposed by the Department of Children, Families and Learning as it relates to districts' ability to maintain local control over selection of their math curriculum. In addition, the likelihood that over 40% of Minnesota students, in mathematics curricula that has been carefully selected by school districts across Minnesota, will succeed on assessments aligned with the proposed standards, is questioned.

Concern

Critics of the current Profile of Learning Standards have stated that the Profile dictated how teachers should teach. The implication is that the proposed content-based standards do not dictate how teachers should teach; that local control is enhanced. However, standards-derived content is going to be covered on state tests, and teachers will have to provide students with the relevant information and concepts, because they are rightfully concerned about their students' performance on state mandated content-based multiple-choice tests. Throughout the proposed elementary level mathematics standards, the documents include expectations that are not at all well aligned with the scope and sequence of skills common to a number of Minnesota school districts. Although standards should not be designed as a match to specific curricula, neither should they be so specific as to limit the local choice and control of school districts. The proposed mismatch will limit the ability of Minnesota school districts to utilize curricula of their choice.

Background

Currently, over 40% of MN elementary students are in districts that have adopted the 'Everyday Mathematics' program, Edina's among them. In the Edina schools, our students have experienced great mathematical success utilizing these materials over the past 13 years. In fact, Edina was one of 13 pilot development sites in the country that worked with content experts at the University of Chicago in the field-testing and implementation of this NCTM standards-based math program. Over that time, we have experienced substantial mathematical growth in our students. This is evidenced by consistently high assessment results on multiple measures as well as course-taking behavior. For example, in contrast to the limits of more traditional materials, we have been able to accelerate the academic achievement of most of our students through the middle school and secondary levels.

One result of the long-term implementation of this program in our schools is that our most capable math students are taking Algebra I in Grade 7, and Geometry in Grade 8. It provides students with the frameworks or strategies for them to learn how to apply or use information or concepts to address real-world, complex problems. A high school Algebra I course has become the standard path for Grade 8 students as a result of the nature of the Everyday Mathematics curriculum. We have successfully expanded the range and levels of mathematics that students can experience.

Unfortunately, the proposed Academic Standards for Minnesota would not serve to accomplish the same result. Those standards appear not to have established an expectation that curricula explore a full spectrum of mathematical thinking, rather than more traditional, basic arithmetic. In such traditional programs, the material presented is not sequenced developmentally, nor connected to periodic practice and review. The proposed standards appear developmentally out of alignment, and to isolate concepts and skills from one another, as well as from problem contexts. Most elementary students do not master a concept the first time it is presented. Traditional American math curricula has been criticized as being "arithmetic driven, slow paced with isolated instruction and very broad without depth" (Education TRUST). To address this, the Everyday Math materials sequence skills cyclically, and designate them as

‘Beginning,’ ‘Developing,’ and ‘Secure.’ To be fairly included on a high stakes state assessment, standards ought to be considered as ‘Secure’ for students. Please note the following comparative study of the proposed standards against the work students accomplish at a ‘Secure’ level in Everyday Mathematics, where this match occurs less than 50% of the time at every grade level.

**Everyday Mathematics & Proposed Minnesota Math Standards
Analysis of Standards and ‘Secure’ Objectives**

Grade	# of Standards Proposed	# of EM Secure Objectives	# of EM Secure Objectives in Proposed Standards	% of Alignment – EM to Proposed Standards
K	30	0	0	0
1	62	22	12	19%
2	62	63	14	22%
3	40	74	12	30%
4	39	49	13	33%
5	40	90	10	25%
6	71	158	30	42%

One can well understand the level of concern this misalignment causes one as we face the development of assessments that encompass these standards at a Secure level (firm grasp of concepts and procedures) of knowledge or application. The ability of a local school district to maintain curricula that has worked well and addresses the appropriate mathematical development of students will be severely compromised.

Additional information to note:

- The committee was to design standards, not dictate curriculum. As the professors and teachers who developed the program found important, at a ‘Beginning’ level, students are to be asked to begin tasks with teacher assistance, but not to explain the concepts or procedures involved; at a ‘Developing’ level, students are to begin to accomplish a task independently and partially explain - with prompting as necessary - the process. ***At neither level would standards be at a level of understanding which ought to be assessed with a high stakes test,*** as students couldn’t reasonably be expected to do well.
- There is a lack of a consistent theoretical underpinning in the proposed standards. They also lack a logical sequence, evidenced by the inconsistent numbers of standards as well as clarity. The Everyday Math ‘spiral’ is an intentional one, with a number of outcomes ‘secure’ at grade 3, and attention to an expanded spiral at grades 4-6. At all levels students experience the major domains; number sense, algebra, geometry, data analysis, and probability. In fact, Everyday Math clearly requires more of students as they progress; leaving one to ponder what the state standards leave out.
- The Governor has made specific references to his perception that MN is losing a position in educational innovation. Yet, this program was developed as an innovation through the University of Chicago School Mathematics Project. In that project, funded by NSF, Exxon, GTE, GE, Ford Motor, Carnegie and Citicorp, they examined successful math curricula from around the world, assessed actual math use by people around the world and considered what we know today about the ways in which children learn math.

- There are discussions at all levels about what ‘math should look like’ - as evidenced by a recent article in the Mpls. paper, as well as opinions expressed by committee members. However, much of the commentary is based in a lack of understanding that we know how to teach math better than we once did. We know that students are capable of learning more math in a richer curriculum - and that it is most meaningful when it is varied, and rooted in real problem solving and application. For example, to limit students, as the committee has suggested, to the use of one algorithm, is an example of a decision that would surely limit their ability to engage in rich mathematical thinking and problem solving.
- The ARC report on the elementary reform (Investigations, Everyday Math or Trailblazers) programs most in use in MN that shows how they outperform students in traditional curricula on nearly all the subtests of tests in 3 states; on a few there was no difference and traditional students never outperformed the reform students in the study. 100,000 students were in the study, 50,000 in reform curricula, 50,000 in traditional and the study matched schools for comparisons so it is a study to note. The Executive Summary and the Results are at <http://www.comap.com/elementary/projects/arc/>
- Among the committee members for math, there was representation by individuals who stand to profit from adoption of their thinking. That promoters of Saxon Math as well as Kumon Math Centers have had input in this process is questionable. A quick look at the standards will suggest a strong match to Saxon materials. Were other publishers able to input the design process?

There is much information to consider as Minnesota selects the standards which will set the course of learning in mathematics for children across the state. At a minimum the work of the committee should not lead to a need for districts to substantially alter or dismantle curriculum or materials that have been selected by educators, making professional decisions, based in a solid research foundation and a history of success for MN students.