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1. There has been a long history in Utah in which mathematicians were not involved in mathematics education. The fault lies both with mathematicians who have not shown sufficient interest and educators who did not want mathematicians looking over their shoulders. Although imperfect, this committee has been a start in the right direction. Committee chair Russell Thompson did a wonderful job of uniting the committee behind the need for an external review. We were very fortunate to have the participation of mathematician Hugo Rossi who is both a talented mathematician and a diplomat. Math educators Gina Post and Lorel Preston made efforts to look at states with high Fordham Foundation ratings for ideas to improve the Utah core. I was impressed with the quality of some of our district math specialists like Lisa Jasumback whose effort to find proper placement for Davis School District math students should be a model for the rest of the state. I was heartened when state secondary specialist Diana Suddreth stated that the new core really is better and expressed her appreciation to the mathematicians who helped. I hope that the 2007 Math Steering Committee will be remembered as the first step toward excellent math education in Utah. I would also like to thank Senators Margaret Dayton and Howard Stephenson who made this happen
2. The committee could not agree on the meaning of “world-class math standards.” In fact, some considered it an ill-defined phrase. I suggested in a meeting that “world-class” meant standards like Singapore and Japan. The item was tabled because we could not reach agreement.
3. The committee was comprised of 12 educators, three mathematicians, and one statistician. Eleven of the 12 educators had already gone on record that the math core did not need to change. Committee Chair Russell Thompson ran the committee fairly to allow all points of view to be addressed. Initially it was hard for me to work with some of the 12 educators, but by the end we all worked reasonably well together. I have sincere respect for many of these educators.
4. Brett Moulding told the committee that we should revise the Math Core Curriculum using the “existing structure” and that the document should be shared with SMECC (State Math Education Coordination Committee) to gain endorsement. SMECC consists of around 60 individuals including district math specialists and a few university math educators.
5. Our committee began work on January 3 and SMECC met to consider our documents on January 25. I prepared draft standards for K-6 based on the California Green Dot standards and draft standards for pre-algebra and algebra 1 based on the California Standards and the Achieve Standards. At the SMECC meeting my drafts were rejected. The state secondary math specialist Diana Suddreth reported, "The SMECC group gave unanimous support to Nicole's direction of rewriting the core by amending the current core. They unanimously rejected cores that ... do not use the Standards that were defined by previous committees. They WANT the Standards we already have and objectives tied to those, with only minor changes to the current core. If we want the support of our districts, it is my opinion that we MUST follow this format."

6. The committee initially felt uncomfortable about having an external review, but under the leadership of Russell Thompson the committee unanimously endorsed the idea of an external review. The three reviewers are given below.
 - Hung-Hsi Wu, mathematician, University of California, Berkeley, member of the National Math Panel, co-author of the California Mathematics Standards
 - Jamie Schielack, mathematics educator, Texas A&M University, lead writer for the Focal Points document
 - Deanna Winn, curriculum specialist, former faculty member from Utah State University, former associate commissioner for higher education, member of the board of WestEd.
7. The time for rewriting the core was quite short. We began on January 3, 2007. At the February 2 meeting the committee passed a motion by a vote of 8 to 5 with 1 abstention requesting more time for completion of the project. The State Office of Education allowed more time for the secondary core only. We met with the external reviewers about the elementary core on April 21. The elementary core subcommittee finished the report less than two weeks later so that it could be reported to the full committee on May 8. We met with the external reviewers about the secondary core on May 14. The secondary core subcommittee met over the next seven weeks and presented the secondary core to the full committee on July 9.
8. We did a poor job of implementing the recommendations for the elementary core of the external reviewer Hung-Hsi Wu. I was only able to attend one of the two subcommittee meetings to implement Wu's suggestions and fellow mathematician Hugo Rossi only attended the other. I pointed out in an unsuccessful email that some of Wu's suggestions had not been implemented, but looking a second time, it is even worse than I thought.
9. The new NCTM Focal Points were very helpful in writing the elementary core. We tried to integrate the Focal Points into the core as best we could. I would not say, however, that we faithfully implemented the Focal Points because the subtitle to Focal Points is "A Quest for Coherence." It was extremely difficult to come up with a coherent focused core by amending the old core. The grade-level learning expectations in the Utah Core are found in the indicators. In the new Utah core grades 4-6 the average number of grade-level learning expectations per grade is 57. In contrast, Japan averages 27 and Singapore averages 15. Singapore's standards are crisp, clean, and clear. Wu said of Utah's elementary core, "There is quite a bit of linguistic overkill in the statements of many standards and, paradoxically, plenty of linguistic ambiguity to go with it too."
10. As with any committee, the product was a compromise of the individuals. Although many of my views were not accepted, I felt treated fairly. The Director of Curriculum and Instruction imposed the format on us; nevertheless, there were many positive changes. Milgram has spoken quite harshly about the revised core, but I think he would agree that it is better than the previous one. I have publicly given the elementary core a grade of B. I would give the secondary core a grade of B-. Even if we faithfully implemented all of the reviewers' suggestions we would not have "world-class standards," because the format is so poor.

11. Getting good standards is only the start. We need quality end-of-level tests with passing scores of high, advanced, and intermediate so that parents know more than if their child is above the lowest bar. We need quality professional development that is not watered down, full of manipulatives, and designed to make teachers feel comfortable. Teachers should be made aware of the possibility of teaching school mathematics as *mathematics*. Teachers should not get math content credit from colleges or departments of education.
12. When broken down by ethnicity, Utah's students are below average in mathematics. Utah's white students are below their peers on the NAEP math tests and on the ACT test. In the 2003 TIMSS international math test, 7% of United States' eighth graders were at the advanced level. Japan had 24% and Singapore had 44% of their students at the advanced level. If Utah's students performed half as well as Singapore's, we would be the envy of the United States. Businesses would be lining up to come to Utah and remedial math in our institutions of higher learning would seriously decline. I ask for your help in improving math education in Utah.