Summary of Administrative Response to MMSD Mathematics Task Force Recommendations

April 2009

Recommendation 1:

Establish the goal of moving to the full use of mathematics specialists in grades 5 through 8 within six years;

MMSD will design professional development to help teachers further their mathematical content knowledge as well as how to best address the diversity of mathematical thinking among the students in their classrooms. MMSD believes that increasing teachers' knowledge of how students learn math before, during, and after middle school will allow teachers to provide more focused and appropriate instruction for every student. Through this effort, the goal of middle school mathematics instruction in MMSD is to prepare students with the knowledge, skills and interest in mathematics to be successful in high school and beyond. In agreement with community input, MMSD believes it is also essential that middle school teachers have a disposition for supporting student learning and building positive relationships with all students. MMSD will work towards developing this disposition through this extensive ongoing professional development.

MMSD is currently working with the University of Wisconsin Mathematics and Mathematics Education Departments to seek funding for and design a multi-year professional development program that will address the needs, both professionally and personally of our current staff. Simultaneously, this professional development opportunity will inform the design and implementation of mathematics courses for future teachers graduating from the University.

Attachments:
January 6th and 7th Community Information Sessions Feedback
Plan for implementation of content-based professional development

Recommendation 2:

Focus hiring of grade 5-8 mathematics teachers on candidates who are mathematics specialists or who commit to meeting the district's criteria for a mathematics specialist within three years;

MMSD will work collaboratively with Middle School Principals, the UW and Human Resources to define district criteria for a mathematics specialist. Teaching and Learning will engage in ongoing discussions with Middle School Principals concerning design of specialist implementation. New applicants to the district and transfers to mathematics teaching positions will be assessed for mathematics knowledge and disposition described in Recommendation #1. The Mathematics Coordinator and Building Administrators will work collaboratively with Human Resources to improve the hiring structures in place for middle school mathematics teachers and to ensure that our high quality math teachers remain in math teaching positions.

Recommendation 3:

Make a much larger commitment to mathematics professional development than has been possible in recent years;

In 2007-2008, every elementary school was allocated at least one .5 FTE instructional resource teacher dedicated to improving instruction in mathematics and literacy. In the upcoming 2009-2010 school year all schools will increase to at least 1.0 FTE instructional resource teacher in the support of mathematics and literacy. Teaching and Learning and Educational Services have engaged in an intense collaborative effort to provide professional development for these teacher leaders.

In 2009-2010 and beyond, an additional FTE will be allocated to the Mathematics Division of Teaching and Learning to address Recommendations #1-4. This resource teacher will work collaboratively with the University of Wisconsin Mathematics and Mathematics Education to design a multi-year professional development plan to increase the pedagogical content knowledge required to be an effective middle school mathematics teacher. Through this collaborative effort, improvements will also be made to the UW pre-service mathematics courses that prepare our future K-8 teachers.

In 2009-2010 and beyond, additional funding will be provided to support the middle school mathematics initiative. Significant funding is necessary to work with up to two cohorts of 25 teachers each year. This funding will provide extended employment pay

and substitutes for collaborative work-time focused on mathematics content for middle school mathematics teachers.

Attachments:
Budget Plans for Task Force Recommendations Implementation Plan

Recommendation 4:

Extend the partnership with the University of Wisconsin and also other colleges and universities, especially with faculty in mathematics and mathematics education, to provide coherent programs that lead to a mathematics specialist certification;

MMSD and the University of Wisconsin have a rich history of collaboration, particularly in recent years. System-wide Change for All Learners and Educators (SCALE) was a five-year National Science Foundation (NSF) funded Math and Science Partnership grant linking STEM faculty with MMSD teaching staff. A variety of collaborative projects stemmed from SCALE, most notable are the Title IIB grant initiatives centered on Math and Science content-based professional development for middle and elementary school staff. Another example of collaboration has been five years of work towards improving the mathematics courses for pre-service teachers. This work has included MMSD teachers, UW Mathematics faculty and UW Mathematics Education Faculty.

Extending this work should include MMSD and the University of Wisconsin and other local Institution for Higher Education finding new and innovative ways for mathematics courses for pre-service teachers and content-based professional development for in-service teachers to be tightly aligned and allow for interaction between both audiences. All learning opportunities for pre-service and in-service teachers should focus on core and critical mathematics that align with the MMSD Middle School Mathematics Standards for both content and process. Facilitators of these learning experiences will use research-based pedagogy that models strategies desired in middle school mathematics classrooms.

Attachments:
UW Math/Math Education Meeting Notes
Article highlighting an example of a Masters program for middle school math and science teachers in Washington, D.C.

Recommendation 5:

Advocate to both the University of Wisconsin and the DPI for a new middle school-level mathematics certification.

The University of Wisconsin and MMSD have been working collaboratively in recent years to make improvements to the mathematics courses provided for pre-service teachers. Through this work, a "half and half" minor (pairing mathematics with another content area) has been created to support deeper understanding for middle school mathematics teachers while still retaining some flexibility in assignment that makes them marketable to middle schools across the state. UW and MMSD will continue to work in this partnership and advocate to the Department of Public Instruction to improve current licensing structures. To date, MMSD has met with the UW three times with a fourth meeting scheduled in late March. The reading specialist certification currently in existence is a promising model that is being examined.

Attachment:
Reading Specialist Description from UW

Recommendation 6:

Give serious consideration to selecting a single textbook for each grade level or course and to requiring a common core sequence across all high schools.

The discussions by community members at the informational sessions provided very contradictory input regarding consistency of curricular resources. One common theme throughout the conversations focused on the words "single textbook". Most participants agreed that a single textbook was not adequate to meet the needs of a diverse group of learners. Rather, all teachers should have access to a consistent set of core resources that aligns with district standards and supports differentiation. Community members also emphasized the need to focus on enhancing teacher capacity.

The District agrees that a "single textbook" will not adequately meet this goal. The goal in MMSD is for all students to have access to the engaging and rigorous mathematics through a common set of core resources aligned to MMSD Mathematics Standards for both content and process. Multi-year plans have been developed to address the curricular inconsistencies currently in place at MMSD elementary schools and high schools, through the efforts of collaborative teacher leadership teams throughout the District.

Both the Task Force and community members emphasized the importance of building teacher capacity regardless of which curricular resources are adopted. Therefore, MMSD will ensure that teachers have access to quality professional development that supports the effective use of core curricular resources in diverse classroom settings. The professional development will continue to further deepen the teachers' mathematical content knowledge and their ability to meet the needs of individual students. Professional development will stress instructional decision making based on continual assessment of students' conceptions and progress towards MMSD Mathematics Standards.

Attachments:
January 6th and 7th Community Information Sessions Feedback
Teaching and Learning Cycle from *Learning Mathematics in the Primary Grades*
Plan to address curricular consistency in the elementary grades within a balanced mathematics framework
Plan to address curricular consistency across all high schools

Recommendation 7:

In making improvements and investing resources, the district should consider how best to reduce the large achievement gaps among subgroups of students.

MMSD will adopt the following vision for Equity Leadership from the National Council of Supervisors of Mathematics and will use this vision to guide professional development, programmatic design and instructional leadership:

> A vision for equity begins with understanding our leadership responsibility to seek out and erase biases and inequities that exist in student learning and assessment experiences. Time and again, too many students-especially those who are English language learners, are poor, disabled, members of minorities, or female-are victims of low expectations by mathematics teachers and by programs with barriers of access to the best school curriculum. Students who do not have access to a *rigorous* and *coherent* curriculum that holds high expectations for each student will have limited opportunities available to them later in school and in life. Leaders in mathematics education have an obligation to provide students with a mathematics curriculum and learning experience that prepares them for their future, whatever that may be. As Kati Haycock (2001) indicates, "to increase the achievement level of minority and low-income students, we need [leaders] to focus on what really matters: high standards, a challenging curriculum, and good teachers."
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> It is the responsibility of mathematics education leaders to ensure that underperforming student populations are identified and to provide teachers with the resources, structures, and accountability to address the identified gaps in student achievement and identified gaps in access to the curriculum. More

specifically, it is imperative leaders help all teachers to collaboratively monitor progress of traditionally underrepresented populations and create strategic plans to raise the achievement of all students, especially those who are underperforming. Mathematics education leaders are responsible for leading teachers out of private practice into a collaborative working culture focused on making thoughtful and consistent decisions about curriculum, instruction, and assessment that will meet the unique needs of all students while at the same time helping students develop deep and connected mathematical understandings.

Leaders need to eliminate practices that begin tracking students in the primary grades or lock students into particular levels of mathematical study, thereby essentially precluding opportunities to learn the mathematics necessary to open future opportunities for success. Effective leaders diminish barriers that limit student access to rigorous mathematics and at the same time ensure that every student is taught by highly qualified and well-informed mathematics teachers.

Attachment:
NCSM Vision of Equity Leadership

Recommendation 8:

A value-added type of analysis of Wisconsin Knowledge and Concepts Examination (WKCE) scores by district, school, and grade level should be made a standard part of district reporting. Value-added analysis gives a more accurate picture of district performance and trends in student achievement, especially in a district like the MMSD with a diverse student population and changing demographics.

The District has been encouraged by the initial experience of using value-added statistical models for measures of accountability, as a complement to traditional status models focused on proficiency attainment. The term "value-added" refers to the contributions teachers and schools make to student achievement. Value-added methods provide a way to measure this contribution. The District is also exploring how the value-added approach can be used to investigate the effects of specific program interventions and initiatives. The following district created assessments will provide additional data points for value-added assessment and continuous improvement.

At the elementary level, the District will work towards institutionalizing the assessments provided in the *Learning Mathematics* documents. Currently each student has a Primary Language Arts Assessment binder assigned to them which stays with them and tracks progress over the course of their elementary school experience. The District will create assessment binders that monitor student learning in both mathematics and literacy.

At the middle and high school levels, district leadership teams will continue to work collaboratively to define essential understandings in mathematics, using tools such as through Eclipse and middle school grading guides. Common assessments will then be developed that reflect best-practices in standards-based assessment. Through common assessments, teachers can work collaboratively to better assess their own practices for programmatic improvements.

Recommendation 9:

More time should be provided for teacher collaboration for teachers to learn from each other, analyze achievement data, meet needs of diverse learners, plan for instruction, and insure both horizontal and vertical alignment of the curriculum.

Through the REaL grant, high schools are working collaboratively to design schedules to have embedded teacher collaboration time for school and district level work. Learning Coordinators are supporting grade level team work and content-based cadres in the middle schools. Professional development and collaboration are being supported through Instructional Resource Teachers at the elementary school elementary school level. All teacher leaders receive regular professional development and collaboration opportunities through support from Teaching and Learning and Educational Services.

Recommendation 10:

Parents should be provided opportunities to learn about district mathematics instruction to be able to assist and reinforce student learning at home.

MMSD will explore new strategies for reaching out to parents for both communication about MMSD math programs and support in helping their students with mathematics at home. MMSD staff will use their websites, parent nights and other suggestions from our preliminary information sessions to better educate parents on how to assist their students in learning mathematics. The Mathematics Division of the Teaching and Learning Department will continue information sessions to update the community and to gather input regarding continued progress towards implementing Task Force Recommendations. Particular attention will be directed towards parents that have traditionally been disenfranchised from District opportunities.

Attachment:
January 6th and 7th Community Information Sessions Feedback

Recommendation 11:

Instruction at all grade levels should focus on the integration of conceptual and procedural knowledge; in particular, laying conceptual foundations for procedural and symbolic manipulation skills.

The term "balanced mathematics" has become an integral part of elementary mathematics education in MMSD. One aspect of the balanced approach is represented in the four block approach to structuring mathematics lessons. The four blocks include Problem Solving, Number Work, Fluency and Maintenance and Inspecting Equations. Each of these components support the development of both conceptual and procedural knowledge.

MMSD middle schools have been transitioning from the previous edition of the Connected Math Project (CMP) to an updated edition titled Connected Mathematics Project 2 (CMP2). The new edition includes a greater emphasis on practice problems similar to those in traditional middle and high school textbooks. The new edition still remains focused on problem-centered instruction that promotes deep conceptual understanding.

Balanced mathematics at the high school level has yet to be discussed and defined. Throughout the high school consistency plan, district leadership teams will engage in this discussion.

Attachment:
Chapter 2 from *Learning Mathematics in the Primary Grades*
Description of improvements from CMP2

Recommendation 12:

Although the increase in the number of students taking and passing Algebra is encouraging, the large number of failing grades is a serious concern. The district should investigate causes of the problem and identify and implement research-based remedies.

Once MMSD high school staff have come to agreement on the core mathematics content that every student is expected to learn within a course, we can begin to develop strategies for assessing student learning more consistently across the district. Through collection of this data, the District can make informed decisions regarding programmatic improvements and development of intervention strategies.

Building on the extensive work already accomplished on interventions in the elementary grades, MMSD will work to identify intervention strategies for students in middle and high school mathematics. MMSD has been exploring models such as the Algebra Intensification Project and Academic Youth Development programs developed through the Charles A. Dana Center. These programs show promise in support of the goals of the REaL grant and would be an effort to keep all students "on-track" for post-secondary opportunities. These represent opportunities for intensifying the study of mathematics for students that are struggling, instead of providing remediation and having students fall behind in their coursework.

Attachments:
Academic Youth Development(AYD) proposal and description
Practices Worthy of Attention highlighting AYD
Algebra Intensification description

Recommendation 13:

The district should pursue a challenging, coherent, and focused K-12 mathematics curriculum that includes core concepts of Algebra and Geometry early enough, and with progressively increasing depth, so that the content covered in Integrated Math I and II or in traditional Algebra I and Geometry courses is mastered by the end of grade 9.

MMSD has developed grade level standards for elementary and middle school mathematics. These standards are in alignment with Wisconsin Model Academic Standards and National Council of Teachers of Mathematics Principles and Standards. Infused throughout all grade levels is a continuous development of Algebra and Geometry that will challenge students and prepare them for a rigorous Algebra course. Madison will continue to prepare all students for the study of Algebra.

When students should take Algebra is still in question. The National Council of Teachers of Mathematics recently published a position paper on this topic that explicitly states:

> Only when students exhibit demonstrable success with prerequisite skills—not at a prescribed grade level—should they focus explicitly and extensively on algebra, whether in a course titled Algebra 1 or within an integrated mathematics curriculum. Exposing students to such coursework before they are ready often leads to frustration, failure, and negative attitudes toward mathematics and learning.

In light of this position paper and current events in California regarding Algebra for all students in the 8th grade, MMSD should continue to monitor the current research regarding this decision. In the meantime, the District should continue to hold high standards for all students in developing a deep understanding of Algebra and Geometry in grade K-8 and access to Algebra in 8th grade will continue to be based upon a collaborative process between teachers, students and parents.

Attachments:
National Council of Teachers of Mathematics Algebra Position Paper
Article: Algebra for All study in Chicago
Article: BOE in CA sued for Algebra in 8th grade
Article: Judge delays 8th grade Algebra requirement
Parent letter for Algebra in 8th grade in MMSD