K-12 Mathematics: Curriculum, Professional Development and Student Learning

Madison Metropolitan School District
December 12, 2006
Students of MMSD
MMSD ENROLLMENT BY ETHNICITY
1991-92 TO 2006-07
In 1999 White students comprised 68% of district enrollment. In 2007 white students comprise 54% of district enrollment. The proportion has decreased every year since 1999. Hispanic students were 5% of district enrollment in 1999 and 13% in 2007.
The number of students considered low income has increased within the district, particularly over the past five years. Over 40% of students resided in low income households in 2006-07.
MMSD SPECIAL EDUCATION ENROLLMENT

1991-02 TO 2006-07

The proportion and number of students which receives special education services has remained stable since 2002 (about 4200 students and 17% of enrollment).
MMSD ESL ENROLLMENT
1991-92 TO 2006-07

ESL enrollment increased this year (3223 to 3566 students, 13.2% to 14.5%).
District Mission

Our mission is to assure that every student has the knowledge and skills needed for academic achievement and a successful life.
All students need to learn math with depth and understanding.

The need to understand and be able to use math has never been greater.

- Math for life
- Math as a part of cultural heritage
- Math for the workplace
- Math for the scientific and technical community
Engagement ↔ Learning ↔ Relationships

- Classroom
- School Community
- Content
- Instruction

Student ↔ Student
Staff ↔ Staff
Staff ↔ Families

Core Practices, Services & Programs

ALL Students

ASSESSMENT

IF A STUDENT ISN’T SUCCESSFUL?

Classroom Specific Supports

SOME Students

School/District Wide Supports

FEW Students

Time Limited Specialized Support

FEWER Students

Long Term Intensive Specialized Support

FEWEST Students

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Equity and Excellence

Superintendent Goals

- Initiate and complete a comprehensive, independent and neutral review and assessment of the District’s K-12 math curriculum:
  - Achievement data
  - Performance expectations
  - Curricula
  - Recommendations for improvement
  - Recommendations on measures to evaluate effectiveness of curricula
Mathematics in MMSD

Elementary
District Resources

- K-5 District Mathematics Standards
- Learning Mathematics in the Primary Grades (Grades K-2)
- Teaching Mathematics in the Intermediate Grades (Grades 3-5) in production
- Everyday Math/Investigations alignment documents
- TAG/Elementary Math Team document for extra challenge
- 4 resource teachers and 6 in-school math facilitators
Curricular Materials

- Investigations
- Everyday Mathematics
- Primary Mathematics (Singapore)
- Pilots
  - Math Expressions
  - Number Worlds
Professional Development

- Learning Mathematics in the Primary Grades
- Committee developing 3-5 version
- Committee updating the Primary Math Assessment
- Expanding Math Knowledge Title IIB Grant
  - Approximately 4 teachers with math focus in degree
Mathematics Standards
Fall 2005
MADISON - All Schools
Grade 04
Mathematics

- Mathematical Processes
- Number Operations
- Geometry
- Measurement
- Stats & Prob
- Algebraic Relationships

SPI Score

State
District FAY
5th Grade Math Assessment Pilot

- Pilot a consistent approach to meet the needs of exceptionally high achieving students in mathematics
- Pilot a system to provide equal access at the beginning of 6th grade
- 22 6th grade students have been placed in Algebra, 1 in Geometry
MMSD 6th Grade Students Enrolled in Math Classes That Are Two or More Years Above Grade Level
Mathematics in MMSD

Middle School
District Resources

- Resources on DWW
  - Modifications
  - Extra challenge problems and links
  - Assessments
- Essential Content documents
- 6-8 District Mathematics Standards
- Technology
- Two Resource Teachers
Curricular Materials

- Connected Mathematics Project 1
- Connected Mathematics Project 2
- McDougall Littell Algebra
- Discovering Algebra
- UCSMP Algebra
- Summer School
  - Math in Contexts
Professional Development

- CMP Leadership Academy
- New Teacher Training by Grade Level
- Math Masters Project
  - 5% of teachers have Secondary Certification in Mathematics
- Summer School Teacher Professional Development
MMSD 8th Grade Mathematics WKCE Standards Performance

Mathematical Processes
Number Operations
Geometry
Measurement
Stats & Prob
Algebraic Relationships

Fall 2003
Fall 2004
Fall 2005
District Resources

- Recommended Minimal Competencies documents for Algebra and Geometry
- Technology
  - Geometer Sketchpad
  - Graphing Calculator and Navigator System
- Department Chair Meetings
- One Resource Teacher
Curricular Materials

- Discovering Series
- McDougal Littell Series
- Core Plus Series
- Variety of curricular materials used at the higher levels
Professional Development

- Algebra Leadership Team
- Geometry Leadership Team
- Integrated Mathematics Leadership Team
- MATC Dual Credit Development Team
Mathematics Standards
Fall 2005
MADISON - All Schools
Grade 10
Mathematics

- Mathematical Processes
- Number Operations
- Geometry
- Measurement
- Stats & Prob
- Algebraic Relationships

SPI Score

State
District FAY
MMSD 10th Grade Mathematics WKCE Standards Performance

Fall 2003
Fall 2004
Fall 2005
MMSD 10th Grade Mathematics WKCE Proficient and Advanced by Ethnicity
MMSD 10th Grade Mathematics WKCE Proficient and Advanced by Income
MMSD HS Students Enrolled in Higher Math by Ethnicity
(Math Higher Than Geometry)
MMSD HS Students Enrolled in Higher Math Classes by Income (Math Higher Than Geometry)
Board of Education Priority

- All students complete Algebra by the end of ninth grade and Geometry by the end of tenth grade
Overall, Algebra completion by the beginning of grade 10 went up for all ethnic and racial subgroups as of 2006-07 compared with previously recorded school years.

The largest relative gain between the previous year of measure, 2005-06, and last school year was among Hispanic students.
As of the beginning of the 2006-07 school year, approximately 64% of all students successfully completed Geometry by grade 11. Geometry completion was comparable to the previous year.

White students continue to be more likely to complete Geometry than other ethnic subgroups. Enrollment among Hispanic American students decreased in 2006-07.
Overall, Algebra completion by the beginning of grade 10 went up for all ethnic and racial subgroups as of 2006-07 compared with previously recorded school years.

The largest relative gain between the previous year of measure, 2005-06, and last school year was among Hispanic students.
At the beginning of 2006-07, both males and females successfully completed Algebra by grade 10 at a consistently increasing rate over the past 4 years.

Students living in low income households who successfully completed Algebra by grade 10 at the beginning of 2006-07 increased since the previous year. Algebra completion for students living in non-low income households did as well.
Algebra completion showed marked improvement among ELL students over the past five years.

Algebra completion by students receiving special education services by the beginning of grade 10 has been increasing consistently for the last 5 years. Algebra completion by students not receiving special education services improved as well.
• As of the beginning of the 2006-07 school year, approximately 64% of all students successfully completed Geometry by grade 11. Geometry completion was comparable to the previous year.

• White students continue to be more likely to complete Geometry than other ethnic subgroups. Enrollment among Hispanic American students decreased in 2006-07.
Geometry completion among females is higher than their male counterparts as of the beginning of the 2006-07 school year. The rate for females increased from one year ago.

Just over 1 in 3 students living in low income households successfully completed Geometry prior to their junior year. This group’s completion rate was only 1 in 5 five years ago. More than 3 of every 4 students living in non-low income households completed geometry by grade 11 as of the beginning of 2006-07.
• Students receiving ESL/Bilingual services have completed Geometry by the beginning of grade 11 at a consistently higher rate over the last four years.

• Over two thirds of non-special education students completed Geometry by the beginning of grade 11 at the beginning of this school year compared to just under one third of the students receiving special education services.