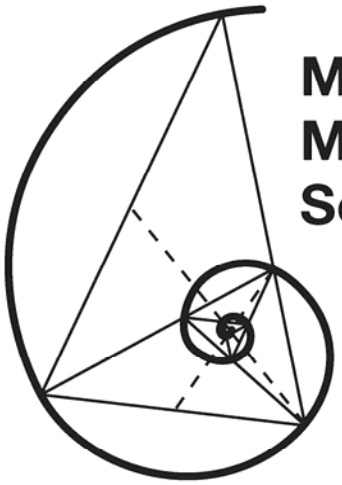

Michigan Mathematics and Science Centers Network

Building a 21st century workforce by inspiring and nurturing excellence in mathematics and science for all Michigan schools, students, teachers and communities.

2007-2008 Annual Report

Prepared by

Science and Mathematics Program Improvement (SAMPI)

Western Michigan University

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MICHIGAN MATHEMATICS AND SCIENCE CENTERS NETWORK

Building a 21st Century workforce by inspiring and nurturing excellence in mathematics and science for all Michigan schools, students, teachers, and communities.

The Michigan Mathematics and Science Centers Network is a primary infrastructure supporting the improvement of mathematics, science, and technology education in Michigan. Programs and services of the thirty-three Mathematics and Science Centers (M/S Centers) are made available to all Michigan public and private schools in their service areas. ***This report summarizes the work across the Network during the 2007-08 school year. Individual Centers produce an annual report of accomplishments available from each Center.***

What's Inside?

FUNDING CHANGES

The Mathematics and Science Centers Program was created by legislation in 1988, providing grant funds to establish Centers in cooperation with school districts, higher education institutions, science museums, and professional associations. Since that time, the program has undergone significant changes, including development of a new Master Plan in 2007 for funding and operating Centers and implementation of several important statewide programs. Today, all school districts across Michigan have access in their region to one of 33 M/S Centers.

Base funding for M/S Centers is now part of the annual State Aid Act-Section 99 and totaled $2.5 million for the 2007-2008 school year. This is the fifth year of **75% reduced** state funding. **Centers continue to be severely handicapped by inadequate funding. Opportunities for schools, teachers, and students to improve science, mathematics, and technology education are in jeopardy. In 2007-2008, state funding cuts resulted in 43% fewer professional development hours for teachers and 81% fewer program hours for students as compared to the 2002-2003 school year.**

IMPACTS AND OPPORTUNITIES
Highlights from the 2007-08 Annual Report

Michigan Mathematics and Science Centers Network

Again in 2007-08, the Michigan Mathematics and Science Centers Network offered programs and services to thousands of teachers and their students, all designed to improve the teaching and learning of mathematics and science. Although a fifth year of significantly reduced funding from the Michigan Legislature necessitated reductions in programming, the 33 Centers continued to provide public and private schools in their regions with various student services, teacher professional development, curriculum, leadership, community partnership, and resource sharing programs. Below are highlights from the annual report of the Michigan Mathematics and Science Centers Network. Readers are encouraged to review the entire report. Information about the Network is available from David Krebs, President (dkrebs@muskegonisd.org; Phone: 231-767-7217) or www.mimathandscience.org.

- In addition to the many regular local and regional activities, the Network facilitated five major statewide projects serving Michigan teachers and their students:
    - Michigan Mathematics Leadership Academy
    - Michigan Science Leadership Academy
    - High School Math and Science Success II
    - Michigan Mathematics and Science Leadership Collaborative
    - Michigan Virtual University Partnership—Online Math and Science Camps
- 12,117 different teachers and other educators participated in programs, including: 4,289 teaching elementary, 2,315 teaching middle/jr. high, 2,523 teaching high school, 201 teaching pre-K, and 2,789 identified as others (administrators, parapros, etc.).
- 1,849 professional development programs were offered: 778 in math, 657 in science, 113 in technology, 29 integrated math/science/technology, and 272 in other topics.
- A total of 10,254 hours of PD were provided; 28,998 total PD enrollments.
- 108,875 students participated directly in Center programs: 32,784 elementary, 31,240 elementary and middle/jr. high, 14,939 middle/jr. high, 4,217 middle/jr. high and high school, 5,533 high school, 7 pre-K, and 44 from mixed grade levels (some students may have attended multiple programs).
- Over the past 10 years, 23,418 PD programs have been offered; total enrollment in 10 years was 352,986 (many teachers participated multiple years in multiple programs).
- In the past 10 years, 2,452,921 students have been served directly by centers (some students served multiple years in more than one program).
- In collaboration with the Michigan Department of Education, the Network coordinated development of the companion documents for the Michigan K-7 Grade Level Content Expectations for Science. Because no MDE funds are available to "roll out" these materials to schools, the Network has "stepped-up-to-the-plate" to provide workshops across the state to assure broad dissemination.
- In partnership with the Michigan Virtual University, Centers enrolled 792 students in the MVU Middle School Math and Science Camps.
- Through a special statewide teacher professional development initiative—HSMASS-II—Centers served 636 high school math and 580 high school science teachers. Teachers learned about the new High School Content Expectations and use of classroom (formative) assessment to improve student learning.
- Through the statewide Michigan Mathematics and Science Teacher Leadership Collaborative (MMSTLC), 58 mathematics and science Teacher Specialist Leaders were prepared to serve more than 200 of their math/science colleagues in about 35 schools and more than 20,000 students in high needs schools.
- Centers targeted high priority schools, providing intensive assistance including classroom-level professional development: classroom observations to identify areas of need, modeling science lessons, targeted small group PD, content integration advice, assessment assistance, achievement gap analysis, and resource acquisition.
- Centers collaborated on activities with 31 different public and private Michigan colleges and universities, engaging science, math, engineering, and technology faculty.
- With a statewide focus on aligning curriculum to the Michigan Grade Level Content Expectations, Centers worked closely with schools to instruct on how to use both the GLCEs and companion documents to improve their K-12 science and mathematics curricula.

NETWORK BOARD OF DIRECTORS AND COMMITTEES

The 2007-08 school year saw major changes in the structure and organization of the Network, as well as expansion of activities and support for individual centers. New roles and responsibilities for the Board of Directors and committees were established.

Non-Profit Organization Status. The Network is now a 501C(3) non-profit organization. The Board of Directors is made up of the Directors of the 33 Mathematics and Science Centers, meeting quarterly to conduct the business of the Network. They annually elect a President, Vice President, Treasurer, and Secretary. Various committees (see below) are appointed by the President. Each committee has an elected chair.

As a 501C(3) organization, the Network can seek, accept, and administer grants and contracts directly (previously it was through one of the individual centers). This provides greater flexibility in securing supplemental and project funding to support the Network and individual Centers, especially in light of the current state fiscal situation. UCI of Ann Arbor, MI is providing financial and other management services to the Network. Science and Mathematics Program Improvement (SAMPI) at Western Michigan University continues to provide evaluation technical assistance, data collection and reporting services.

Collaborative Relationship with the Michigan Department of Education. Centers continue to receive allocations from the Michigan Legislature, which requires that the Michigan Department of Education (MDE) provide oversight and guidance to the Centers about programming and other requirements. However, the Network collaborates with MDE, both supporting the improvement of mathematics, science, and technology education in Michigan and assisting the Department with selected state level initiatives. Centers also provide a venue to help MDE disseminate educational support materials, services, and programs.

Committee Structure. In compliance with 501C(3) expectations, the Board of Directors uses both permanent and temporary committees to advance its various internal and external programs and services. An Executive Committee, made up of Network officers and chairs of permanent committees, meets quarterly (or more often as needed) to plan Board meetings and conduct business between Board meetings as necessary. Permanent committees include Communication, Governance, Evaluation, Finance, Audit, Legislative, and Policy and Procedures. Special committees and task forces are appointed for specific projects or initiatives.

NETWORK BOARD OF DIRECTORS AND COMMITTEES continued...

PACE and Partners. Through a grant from the W.K. Kellogg Foundation, PACE and Partners of Lansing, a public relations firm, has been working with the Network over the past three years to raise awareness among state policy makers, philanthropic organizations, and the business community about the importance and value of the Centers to the K-12 educational community they serve. PACE has been an envoy to decision-makers across Michigan, organized a statewide "Math and Science Summit" in 2006, identified potential partners for the Network, helped revise the Network Master Plan this past year, coordinated development of a strategic business plan, helped redesign the Network website, and developed a variety of promotional materials.

Master Plan. A 5-year Master Plan for the Michigan Mathematics and Science Centers Program was approved by the Michigan Board of Education in 2007. The goal of the plan is to provide a framework for the program "to thrive and provide continued service to Michigan teachers and students for the duration of the plan and beyond." The plan can be accessed at http://mimathandscience.org/, click on Stakeholders.

New Website. The Network inaugurated a new website in 2008, http://mimathandscience.org/. The updated website provides information about the Network and its activities, as well as links to the 33 individual centers and their programs. A password-protected portion of the site contains documents, forms, and guides for Center Directors and staff.

Partnering with Michigan Virtual University (MVU). The Network is working collaboratively with MVU to provide summer and school year opportunities for middle and high school students for online courses and other web-based activities. A new program, "Back on Track: Ready for Algebra!," is being implemented in the 2008-09 school year. It is designed for students needing extra help in meeting new state-level algebra requirements.

Statewide Projects. The Network continues to facilitate various statewide projects, described in a later section of this annual report. These projects afford the Network with opportunities for supplemental funding to provide common programming statewide and to partner with various agencies and organizations in Michigan and beyond. For example, special allocations from the Legislature have funded the 3-year High School Math and Science Success (HSMASS) teacher professional development series to build capacities among high school mathematics and science teachers to effectively implement the Michigan Merit Curriculum in classrooms across the state.

Michigan Mathematics and Science Centers Network—
Michigan Department of Education
HIGH SCHOOL MATH AND SCIENCE SUCCESS-II (*HSMASS-II*)

Michigan Mathematics and Science Centers Network
STATEWIDE PROJECT
Building a 21st century workforce by inspiring and nurturing excellence in mathematics and science for all Michigan schools, students, teachers and communities.

SELECTED FINDINGS FROM THE EXTERNAL EVALUATION OF *HSMASS-II*

HSMASS is a statewide collaborative effort of the Michigan Mathematics and Science Centers Network begun in 2006 to provide high school mathematics and science teachers with professional development opportunities designed to help them improve teaching and learning and increase student success. **HSMASS-II**, implemented during the 2007-08 school year, was designed to 1) increase awareness and knowledge of the new High School Content Expectations (HSCE) and the mathematics and science companion documents, 2) improve teacher knowledge and pedagogical skills related to classroom (formative) assessment, 3) increase student knowledge about selected mathematics and science topics, and 4) increase teacher knowledge and skills for preparing instructional activities using the companion documents. Centers across Michigan conducted a series of workshops for 8^{th}-12^{th} grade mathematics and science teachers in their service areas. Below are summary statements based on an analysis of data collected as part of the external evaluation. Reports based on other evaluation data, as well as detailed information supporting this report, are available.

- In collaboration with the Michigan Department of Education, during the 2008-09 school year, the Network developed professional development materials, trained facilitators, planned and implemented workshops, and conducted a results-oriented external evaluation at Centers across Michigan.
- The Network conducted half and full day workshops, serving 636 high school mathematics teachers and 580 high school science teachers.
- Results of a pre/post test of students of participating teachers shows an increase in scores pre to post for both mathematics and science across the Network. In mathematics, 90% of the Centers exhibited a statistically significant increase. In science, 87% showed a statistically significant increase. Students were also asked to report the confidence of their answer. Student confidence increased in both mathematics and science.
- Results of a pre/post assessment/survey of participating teachers show a significant increase in mean score ratings pre to post on all items related to workshop topics and activities.
- Most teachers indicated very little familiarity with the attributes of formative assessment and its application in the classroom. By the end of the workshop series, they indicated significantly improved familiarity and understanding. There was a statistically significant positive change pre to post.
- There was an increased percentage of teachers selecting the correct answers to items related to classroom use of formative assessment from pre to post on the teacher evaluation.
- About 80% of math teachers were able to identify one of two primary reasons for including various components in the content expectations clarification documents; science teacher's ability to identify primary reasons for including particular information in the science companion documents increased from pre to post.

Center director interview data indicates HSMASS-II was a powerful way to provide teachers with important information regarding classroom-level formative assessment and test-item writing. Teachers learned how to more effectively use the mathematics and science state-level content expectation clarification documents.

For more information about the HSMASS-II evaluation, contact Kristin Everett or Mark Jenness at SAMPI (Phone: (269) 387-3791 or kristin.everett@wmich.edu or mark.jenness@wmich.edu).

Michigan Virtual Middle School

The Network (MMSCN), in partnership with the Michigan Virtual University (MVU), offered online mathematics and science camps to middle school students in selected Centers across the state. Through the Title II, E-Learning and Virtual School Initiatives grant, and Michigan Department of Education funding, camp "scholarships" were made available to Michigan students to attend the first-ever Michigan Virtual Middle School Math and Science Camps. Scholarships were distributed through the Network.

Eight Centers participated in this first-year effort: Allegan, Dickinson-Iron-Menominee, Lapeer, Northwoods (Escanaba), Capital Area, Eastern U.P., Mason-Lake-Oceana, and Wayne RESA

792 students initially enrolled; 527 received Certificates of Participation for completion of the 20-hour program

Students completing the program could use their participation to meet the new Michigan high school graduation requirements of an online learning experience

Center staff facilitated the camps as coordinators and teachers; they were trained by MVU staff; Michigan Virtual Schools instructors created and taught the online components of the camps

Goal of the program was for students to "strengthen their study habits and deepen their understanding of key concepts in math and science"

Campers used *ExploreLearning Gizmos*, specially licensed innovative online manipulatives, to challenge "campers to think and reason, to solve complex problems, and to communicate their ideas"

There were 13 sessions of the math camp and 8 sessions of the science camp

Two-week sessions of 20 hours were provided in three different formats: 1) On-site at Centers with individual and small group hands-on activities, whole group events, and individual online sessions; 2) Kick-off day at the Center, followed by students accessing the program online from home or elsewhere; and 3) Students enrolling and participating entirely online from home or other site

The Network-MVU partnership continued and expanded in Summer 2008. Summary reports will be created as information becomes available.

For more information about the Network-MVU partnership, contact Dee Benjamin, Director, Dickinson-Iron-Menominee Math, Science, and Technology Center (906-779-2609 or dbenjamin@diisd.org) or Jamey Fitzpatrick, Director, Michigan Virtual University (517-336-7733 or jfitz@mivu.org)

Michigan Science Leadership Academy (MSLA)

The Michigan Science Leadership Academy (MSLA) is a Michigan Mathematics and Science Centers Network initiative focused on providing statewide professional development and other services to support and improve the teaching and learning of science. MSLA coordinates statewide science materials development projects, teacher workshops, and dissemination efforts of the Network.

Michigan Mathematics and Science Centers Network
STATEWIDE PROJECT

In the 2007-08 school year, MSLA focused its efforts on two major projects:

Development of COMPANION DOCUMENTS for the Michigan K-7 Grade Level Content Expectations for Science

Beginning in January 2008, a committee representing the Mathematics and Science Center Network, Michigan Science Teachers Association (MSTA), and the Michigan Department of Education (MDE) met monthly to design and develop Companion Documents for grades K-4th and 5-7th. A writing team made up of individuals nominated by the Centers worked throughout the summer to write the "clarifications" for grade level expectations. These materials provide classroom teachers with "boundaries to the content expectations" around eight categories: *Clarifications; Vocabulary; Instruments, Measurements, and Representations; Inquiry Instructional Examples; Assessment Examples; Enrichment and Intervention; Examples, Observations, Phenomena; and Curricular Connections and Integrations.* The Companion Documents are intended to "help teachers and curriculum developers design their own lesson plans, select useful portions of text, and create assessments that are aligned with the Michigan grade level science curriculum."

Dissemination of the Companion Documents. Efforts are underway by the Mathematics and Science Centers Network to "roll out" the Companion Documents to teachers, schools, and districts across the state. Because funds are not available from MDE, the Network, through the MSLA committee, has "stepped-up-to-the-plate" to take responsibility for disseminating the materials through a series of workshops across the state, assuring a broad dissemination to teachers, schools and districts.

Development of Inquiry in Instruction (I^3) Materials for the Network's Statewide HSMASS Initiative

Drawing on the expertise of staff from Centers across the Network, a set of workshop materials for Phase III of the statewide professional development program, High School Mathematics and Science Success (HSMASS) were developed. This committee also organized and facilitated a two-day workshop to train Center-level facilitators on how to use the materials to conduct workshops for high school science teachers. The goal of I^3 is to improve the teaching and learning of science using research-based inquiry-focused strategies. Workshops began in Fall 2008 and will continue through Spring 2009.

For more information about MSLA, contact
Dr. LaMoine Motz at the Oakland Schools Science/Math/Technology Center
(248-209-2378 or LaMoine.Motz@oakland.k12.mi.us)

For more information about the Companion Documents and content expectations,
go to Michigan.gov/mde
or contact Kevin Richard at the Michigan Department of Education
(517-540-6805 or RichardK1@michigan.gov)

INNOVATIVE STUDENT PROGRAMS

In Centers across the Network, students have opportunities to learn and work in unusual environments; sample *S*cience, *T*echnology, *E*ngineering, and *M*athematics (STEM) careers; and engage in real-world research with practicing scientists and other professionals. Often partnering with business and industry, government agencies, non-profit organizations, and individuals, programs are designed to motivate ALL students to pursue STEM subjects in elementary, middle, and high school, as well in college and adult careers. Interesting and exciting opportunities made available through M/S Centers, and not usually available in their home schools and districts, open new worlds to these students.

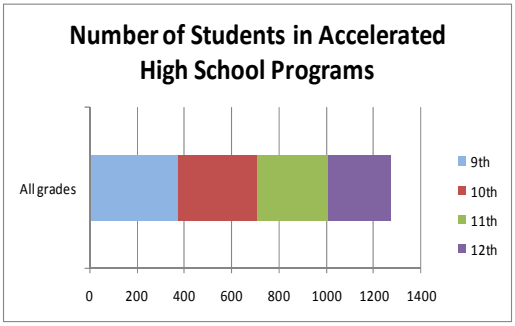
Accelerated High School Programs

High School students spend half of each school day at Centers enrolled in challenging and diverse college preparatory programs in science, mathematics, and technology. Equipped with up-to-date science and computer labs, students engage in activities to learn about basic and cutting-edge STEM topics.

Many students, as part of their Math/Science Center experience, are also enrolled in college courses, where they learn college-level science and mathematics subject matter.

In the junior/senior years, students have opportunities to work with mentors, including physicians, surgeons, computer scientists, chemists, veterinarians, field and lab biologists, and other researchers.

Seven Centers currently provide accelerated high school programs: Battle Creek area, Berrien County, Kalamazoo area, Macomb County, Mecosta-Osceola Counties, Oakland Schools, and Sanilac County.



In the 2007-08 school year, 1,227 students were enrolled in accelerated high school programs. At least 99% entered college programs. Students graduated with ACT scores above state and national averages. For example, seniors at Mecosta-Osceola graduated with an average ACT of 28; a high proportion of students from Berrien County scored over 29 on the same test.

Students who graduate from these programs receive millions of dollars in scholarships for colleges and universities in Michigan and beyond. Many receive cash and other awards in state and national research competitions.

Innovative Student Services

Many Centers provide innovative outreach programming using local resources to provide opportunities and meet needs of schools, teachers, and students in their service areas. These highly motivating programs are not otherwise available to schools. Innovative instructional practices are used to engage ALL students. Below are a few examples of unique programming provided by Centers.

- At the AMA ESD/Iosco RESA Math Science Center's Sprinkler Lake Education Center, students are welcomed to ***Camp Wilderness*** each summer. Both day and residential camps are offered. Students explore the natural world in the Huron National Forest to learn first hand about wildlife management, water resources, ecosystems, forestry, etc.

- ***Interactive distance learning*** in science is available to middle and high schools in the Genesee Area Math and Science Center service area. Students in three classes in different schools receive advanced programming from a single instructor and are able to interact with each other and the teacher during regular science class periods.

- A ***Math and Science Career Symposium for middle school girls*** was provided by the Macomb Math and Science Center, giving more than 300 students opportunities to interact with women professionals in more than 25 math and science-related careers.

- The Muskegon Area ISD Regional Mathematics and Science Center celebrated its 25th year of the ***West Michigan Science Challenge***, a program involving 5th through 12th grade students from four counties. To participate, students must conduct science experiments consistent with scientifically valid methods and present their results to judges.

SUMMARY OF MAJOR ACCOMPLISHMENTS and RESULTS
Summer 2006-Fall 2008

Begun in July 2006, the Michigan Mathematics and Science Teacher Leadership Collaborative (MMSTLC) is a statewide partnership among the Michigan Mathematics and Science Centers Network, Grand Valley State University, Saginaw Valley State University, The University of Michigan—Dearborn, The University of Michigan—Ann Arbor, and the Michigan Department of Education. Purposes of the collaborative are to develop a cadre of teacher leaders; establish collaborative working relationships among teacher leaders, school administrators, Math/Science Centers, and STEM (Science, Technology, Engineering, Mathematics) faculty; improve mathematics and science teaching and learning in targeted high priority schools; and increase capacities of Math/Science Centers to sustain support for teacher leaders and high priority schools.

Established 8 core Math/Science Center-based teams for Cadre I and began capacity-building in 2007-08, continuing into 2008-09

Established 11 core Math/Science Center-based teams for Cadre II and began capacity-building in 2008-09 school year

Prepared 58 mathematics and science Teacher Specialist Leaders in Cadres I and II to serve more than 200 of their math/science colleagues in about 35 schools and more than 20,000 students

Distributed $1.6 and $2.0 million respectively to Cadres I and II to support their work in improving mathematics and science teaching and learning

Offered competitive grants to Cadre I teams totaling $320,000

Created a website (www.mmstlc.net) for general audiences, with links to sites for MMSTLC teams to access resource materials

Provided more than 125 hours of state-level professional development over 1.5 years to Cadre I teams, including about 60 hours devoted to math and science content and pedagogy* and ~40 hours to building leadership skills

Provided 78 hours of professional development to Cadre II teams in their first eight months, including about 27 hours of math and science content and pedagogy* and ~20 hours building leadership skills

Supported four-month sabbaticals for 9 Cadre I Teacher Leaders and release time for 19 (working in teams in their schools) to enhance their capacities to help colleagues improve math/science teaching and learning

Implemented by Cadre I Teacher Leaders and other Core Team Members a total of 319 PD, student, and other MMSTLC activities at the Center/school level July 2007-June 2008; a total of 1436 hours provided; attendance of 4388 across all activities

Prepared a variety of MMSTLC math/science content and pedagogical instructional, professional development, and leadership materials for Teacher Leaders and other core team members

Data in items with an asterisk (*) were supplied by Moore and Associates, Inc., Southfield, MI MMSTLC External Evaluators

SUMMARY OF MAJOR ACCOMPLISHMENTS and RESULTS
Summer 2006-Fall 2008

IMPACTS ON CADRE I TEACHER LEADERS

Results of a *Science* Teacher Leader pre- and post-program content test show total mean scores increased 5.5 points, a statistically significant change.*

Results of a *Mathematics* Teacher Leader pre- and post-program content test show total mean scores increased 0.6 points, not a statistically significant change.*

Science* Teacher Leaders' perceptions of their preparedness to use inquiry-focused instructional strategies in their science classrooms increased for selected items, including "Develop students' conceptual understanding in science," "Lead a class of students in using investigative strategies," and "Assess students' science content knowledge and skills through open-ended verbal or written responses."

Mathematics* Teacher Leaders' perceptions of their preparedness to use inquiry-focused instructional strategies in their math classrooms increased for selected items, including "Develop students' conceptual understanding of mathematics," and "Assess students' mathematical content knowledge and process skills through open-ended verbal or written responses."

In the same surveys, both *science* and *mathematics* Teacher Leaders indicated an increase in their preparedness to work with their teacher colleagues on inquiry-focused instructional strategies.

This summary was prepared by Science and Mathematics Program Improvement (SAMPI)
Western Michigan University 269-387-3791 1-09
Data in items with an asterisk (*) were supplied by Moore and Associates, Inc., Southfield, MI
MMSTLC External Evaluators
For more information about MMSTLC,
contact Walter Rathkamp at SVSU (989-964-4117 or rathkamp@svsu.edu)

FOCUS ON "HIGH PRIORITY" SCHOOLS

Providing services to high priority schools continues to be a major focus of Michigan's M/S Centers. As high priority schools are identified by the Michigan Department of Education, Centers make a variety of programs and services available to help improve teaching and learning of mathematics and science at identified schools. Needs assessments are conducted to target services to the specific needs of underachieving school buildings and districts. Examples of the types of services offered are described below.

Examples of Services to High Priority Schools

- Centers target high priority schools each year for intensive assistance that includes building-wide professional development. Much of the PD occurs at the classroom level and includes (1) classroom observations to determine areas of need, (2) modeling science lessons, (3) targeted small group PD designed to meet the identified needs, (4) content integration advice, (5) assessment assistance, (6) gap analysis, and (7) resource acquisition.
- Centers around the state are providing intensive professional development to teachers in high priority schools through MMSTLC (Michigan Mathematics and Science Teacher Leader Collaborative). Nineteen M/S Centers have participated in the training sessions, including participation of urban schools in Flint, Detroit, Saginaw, Southfield, Kalamazoo, and Inkster.
- Battle Creek Area M/S Center has targeted a group of underachieving schools for intensive interventions for the past ten years. Prior to the interventions, the percent of students reaching proficiency levels was 51% of the state average. Percent proficient is now equal to the state average. BCAMSC also received a grant to provide assistance to high priority middle schools.
- In addition to on-going programming targeted to overall math and science weaknesses in the service area, Eastern U.P. M/S Center staff are working directly with a high priority alternative high school. An intervention team (made up of the M/S Center director, staff, and math consultant) will work directly with the school's principal, teachers, and a MDE trained external coach.
- Project: Making Mathematics Matter (PM^3), a Wayne County initiative between the Wayne County M/S Center at Wayne RESA, the University of Michigan-Dearborn, and the Hamtramck and Highland Park school districts, was selected as a exemplary professional development program and will be presented at a national conference. This was funded through a Math and Science Partnership grant to increase the body of research about what kind of professional development makes a positive difference, specifically for mathematics teachers. Mathematics Institute classes were developed for fifty teachers in grades 4 through 8 from Hamtramck and Highland Park. Overall, the Institutes resulted in substantive improvement in mathematics content, pedagogy, and instructional practice.

Muskegon Area Middle School Mathematics Improvement Project (M^3IP 2)

M^3IP 2 was a partnership with Muskegon Heights Public Schools, Muskegon Public Schools, WayPoint Academy (formerly known as MTA), Western Michigan University and the Muskegon Area M/S Center. This four-year project brought together general education and special education teachers of mathematics for grades 5 – 8. The purpose of this project was to help districts improve the teaching and learning of mathematics in order to increase student achievement. Evaluation of the project showed the percentage of students with Proficient and Advanced Performance Levels for Muskegon Public Schools increased for grades 6 – 8 when 2006 and 2007 MEAP data were compared**.** Muskegon Heights Public Schools saw increases in MEAP scores in grades 6-8 as well.

PROFESSIONAL DEVELOPMENT

State Board of Education Major Activity: *"Develop and implement a framework for excellence in teacher preparation."*

NCLB goal: *"Preparing high quality teachers."*

Mathematics and Science Centers Network Goal: *"Provide professional development opportunities to strengthen and update teaching practices based on current research and local needs."*

12,117 teachers and administrators enrolled in one or more professional development sessions facilitated by M/S Centers. These participating teachers and administrators averaged 13.5 hours of professional development offered by M/S Centers in 2007-2008.* A slight decrease from the previous year reflects reduced funding.

*Detailed numbers of hours, enrollments, and content of professional development sessions can be found on pages 28-29.

How are M/S Centers supporting teachers in meeting NCLB challenges?

- Centers facilitate and support teachers in developing teacher portfolios with records and certificates of completed professional development.
- A statewide teacher leader program builds capacity of selected teachers to plan and deliver PD at schools in their areas.
- Center directors provide support to administrators and teachers through phone, email, and direct contact in regards to "highly qualified issues."

1,849 professional development sessions were offered by M/S Centers in 2007-2008.

10,254 hours of professional development programming were offered by M/S Centers in 2007-2008.

TYPES of PROFESSIONAL DEVELOPMENT OFFERED THROUGH CENTERS' PROGRAMMING

- **Content knowledge workshops**
- **Professional development series**
- **Graduate courses**
- **Courses leading to certification in mathematics and science**
- **Distance-learning series**
- **Sponsorship of teachers to attend educational conferences**
- **New teacher induction programs**
- **Mentoring programs**
- **Summer institutes**
- **Video-conferencing**
- **In-class coaching**
- **Technology training and integration**
- **Lesson study**
- **Professional learning communities and study groups**
- **Online webinars and classes**

Examples of Professional Development Targeted at High Priority Schools

- In an effort to support schools with special education subgroups that did not make AYP, Allegan County M/S Center offered a 90 hour professional development workshop for high school special education teachers.
- The Grand Traverse Regional M/S/T Center has led significant efforts to help align curricula and provide training in research-based instructional practices.
- Manistee, Wexford-Missaukee M/S Center works intensively with a local alternative academy, assisting with curriculum, instruction, assessment, and intervention ideas. Additionally, Center staff review school data and offer support in setting goals and proficiency targets.
- In many Centers, teachers are trained to analyze MEAP data to identify gaps in student knowledge and problem solving abilities.

IMPACTS AND OPPORTUNITIES: PROFESSIONAL DEVELOPMENT SERVICES

Michigan M/S Centers lead teachers in developing an understanding of Michigan's new Grade Level Content Expectations (GLCEs) and High School Content Expectations (HSCEs).

- Teachers throughout the state participated in High School-Math and Science Success (HS-MASS II), a program to assist secondary math and science teachers' understanding and use of the new Grade Level Content Expectations.

M/S Centers organized the writing of and led roll-outs of the newly released K-7 science GLCEs.

- Battle Creek Area M/S Center agreed to organize and facilitate the writing of the K-7 Science Companion Document for the MDE. The result is a comprehensive document to assist Michigan teachers in implementing the new curriculum.
- M/S Centers offer in-person and distance learning workshops to aid teachers in the implementation of the mathematics and science GLCEs. Centers offering workshops included CASM, CMU, St. Clair, Genesee, Grand Traverse, and Mecosta. During the "roll-out" of the science HSCE, teachers studied the standards, explored course configurations to meet the MMC graduation requirements, compared instructional materials, and continued efforts to align current science curricula.

Addressing the math GLCEs throughout the state.

- Teachers learn research-based instructional strategies and meaningful problem-solving activities aligned to the GLCEs. Allegan and Berrien M/S Centers conducted workshops addressing the GLCEs.
- K-8 math teachers were trained on M-GLAnCE (Michigan Grade Level Assessments and Content Expectations). (This example is from the Grand Traverse M/S Center.)

Centers offer workshops with materials aligned to the GLCEs.

- Teachers participated in school year workshops that build knowledge of the HSCEs and strategies to engage *all* students in learning. For example, Oakland offered a series of workshops for life and earth science teachers based on the GLCEs for science.

Teachers are becoming mathematics and science leaders in their schools and districts.

- As part of the Michigan Mathematics and Science Teacher Leadership Collaborative (MMSTLC), teacher leaders work with STEM faculty and others to address mathematics and science needs in local schools.
- Through MMLA (Michigan Mathematics Leadership Academy) teachers, coordinators, and administrators participate in trainings and then bring back materials and information to share with their schools and districts.

Teachers gain knowledge about the new Michigan Merit Curriculum graduation requirements and the Michigan Merit Exam.

- Teachers around the state explored course configurations to meet the MMC graduation requirements.
- Throughout the state, teachers became familiar with the structure and effective techniques for teaching the mathematics and science content of the MME through professional development sessions.

Teachers who participate in Center programming learn research-based, best instructional practice for all students in their classrooms.

- Teachers network-wide are engaged in best practice workshops and learn skills that are easily transferable to the classroom.

STUDENT SERVICES

Dept. of Education Strategic Goal:
"Attain improvement in academic achievement for all students with primary emphasis on high priority schools and students"

Examples of Programs for Under-represented Students

- M/S Centers provide strategies for teachers to work with special needs students such as differentiated instruction, lessons for multiple intelligences, and methods for teaching writing and literacy.
- Active recruitment of under-represented students for accelerated and special programs, including summer camps.
- Conferences for middle school girls focused on math, science and/or engineering.

NCLB goal:
"Improving the academic achievement of the disadvantaged"

Support for Students Attending <u>High Priority</u> Schools

- M/S Centers annually identify high priority schools for targeted programming such as summer courses and special mathematics and science opportunities that support and enhance classroom work.
- Whenever possible, programs are offered to students at no (or low) cost.

NCLB goal:
"Promoting innovative programs"

Accelerated High School Programs

- Eight Centers provide advanced mathematics and science courses through half-day accelerated high school pull-out programs in collaboration with local districts. Recruitment of minorities is a high priority. See page 16 for reported outcomes of these programs.
- Centers save Michigan families money by providing Advanced Placement Courses and Dual Enrollment opportunities with local colleges.

What types of outreach services are provided to students by M/S Centers?

- **Weekend, evening, and after-school programs**
- **Research and professional programs**
- **Classroom instructional programs**
- **Outdoor education programs**
- **Mathematics, science, and engineering fairs**
- **Summer camps and academies**
- **Internships in industry and medical fields**
- **Mentoring**
- **Academic competitions/LEGO Leagues**
- **Advanced technology training**
- **Online learning through MVU**

CUTS TO STUDENT PROGRAMMING

Due to the fifth year 75% cut in base funding to M/S Centers, student programming hours have been drastically reduced. In the past year, there were 81% fewer programming hours than six years ago. In addition, one accelerated high school program closed and others are in jeopardy.

IMPACTS AND OPPORTUNITIES: PROGRAMMING FOR STUDENTS

Test Scores

- Common online mathematics assessments are being used region-wide. Analysis of this online testing (made possible by Centers) has allowed teachers to improve instruction and identify needed resources. (This example is from five Upper Peninsula Centers, AMA, COOR, and Manistee/Wexford Center.)
- Schools that have worked most intensively with a Center are showing increases in MEAP test scores. (This example is from Allegan, BCAMSC, Lapeer, Macomb, Manistee-Wexford, Muskegon, Northwoods, Oakland, St. Clair, and Wayne.)

Increased student access to quality mathematics and science programming

- Michigan Virtual High School Courses are available through the M/S Centers.
- Students across the state have access to Star Lab and Science Olympiad programs.
- Students have opportunities to attend and present at events such as "Ecology Day," regional "Mathematics, Engineering, and Science Symposiums," and other academic competitive events.

- Middle School Math provided weekly instruction in problem-solving for 40 students, increasing scores on problem solving test items as well as interest in mathematics. (This example is from BCAMSC.)
- Mathematics-Science Partnership (MSP) Grant in Mathematics: Middle school students whose teachers participated in the grant increased their test scores from pre- and post by an average of 8%, compared to 0.6% for a comparison group of teachers. (This example is from The Seaborg Center.)

Battle Creek Public Schools—A Tale of Success!

The Battle Creek M/S Center completed its 10th year of providing assistance to underachieving schools. The long term goal for Battle Creek Public Schools (BCPS) is to increase the ratio of the district to state 5th grade science MEAP scores so that the district is equal to or above the state average. When BCAMSC began working with BCPS, the ratio had remained fairly steady at about 50% of the state MEAP average for 5th grade science. This year, for the first time in history, Battle Creek Public Schools 5th grade science MEAP scores equaled the state average! Center staff meet with building science leaders and communicate electronically on a regular basis. In a time of high teacher and administrator turnover, decreasing student enrollment, increasing test scores has been rewarding and challenging.

Real World Applications

- 200 students in Allegan attended WMU's Senior Engineering Project day and toured the engineering campus, thanks to a $3,500 grant from the DeLano Foundation.
- Designing and conducting formal research allows students to engage in scientific inquiry. At the Battle Creek Area M/S Center, students identified specific areas of interest and mentors guided them to frame researchable questions. Students who enrolled in the BCAMSC research methods course met with Kellogg company scientists to brainstorm research topics for the upcoming school year.
- The Western U.P. Center naturalist educator engaged K-8 students in a variety of inquiry-based activities using area forests, fields, wetlands, and streams as classrooms.

IMPACTS AND OPPORTUNITIES: PROGRAMMING FOR STUDENTS (continued)

Increased Interest in Mathematics and Science

- Results from a comprehensive longitudinal study indicate the Science, Technology, and Engineering Preview Summer (STEPS) Camp for Girls does influence college major choices. In this year's survey, every respondent planned to attend college or a technical school in the fall of 2009. Over 90% of the respondents reported an increased interest in careers related to science, mathematics, or engineering. (This example is from the Grand Valley State University Regional M/S Center.)
- At the Genesee M/S Center in the Flint area, the "Mr. Science" program served over 1,700 students in the 2007-08 school year. Its presence in classrooms has positive effects on both teacher and student attitudes towards science. Teachers are more willing to try new instructional strategies modeled for them through the program. Teachers have showed a renewed interest in teaching science using more than just their textbooks. Building principals and curriculum specialists are also seeing changes. One said, "Mrs. Johnson, who barely taught science in years past is now keeping a classroom garden to help teach about plants." The number of principals asking to participate in the program has increased significantly.

Examples of Opportunities for Students to Participate in Academic Competitions

- Through efforts of M/S Centers, students around the state have had opportunities to participate in science fairs, olympiads, and competitions.
- Students in the Mason-Lake-Oceana service area earned first place in a regional MATHCOUNTS competition.
- The "You Be the Chemist" competition engages 5th to 8th grade students around the state in science. Participation has increased significantly in participating Centers.
- LEGO Robotics tournaments prepare students across the state for high technology jobs requiring innovative thinking and teamwork.

EXAMPLES OF OUTCOMES IN ACCELERATED HIGH SCHOOL PROGRAMS

- More than 99% of students in Center sponsored accelerated high school programs go on to pursue college degrees.
- Students graduating from accelerated HS programs received millions in grants: $39.4 million for Detroit Public Schools, $3.2 million in the Kalamazoo area, over $1 million in Berrien County, and $194,000 in Oakland County.
- The nineteen graduating seniors from the Berrien County Center scored an average of 30 on the ACT.
- All seniors at Macomb MSTC were enrolled in AP science and calculus courses. 100% of the graduating seniors were accepted by institutions of higher education.
- Students at the Sanilac County Science and Mathematics Center presented research at several research expos, symposiums, and competitions.

LEADERSHIP

Michigan Department of Education School Improvement Framework Standard: *"Create a shared environment where everyone contributes to a cumulative, purposeful, and positive effect on student learning."*

Mathematics and Science Centers Network Goal: *"Articulate a shared vision of improved teaching and learning of mathematics and science, facilitate collaboration among Centers, and develop professional development programs to meet the needs of Network members."*

NETWORK LEADERSHIP ACTIVITIES

Each quarterly Network meeting includes presentations about new resources and programs, updates on MDE initiatives and grant opportunities, and focused workshops related to Center functions and organization, evaluations, professional development, etc.

Intensive two-day training sessions for implementation of the HSMASS statewide project are prepared and facilitated by Center Directors for their colleagues.

STATEWIDE INITIATIVES

The Michigan M/S Centers Network has a taken a lead role in several major statewide initiatives to improve mathematics and science:

- Michigan Mathematics Leadership Academy (MMLA)
- Michigan Science Leadership Academy (MSLA)
- Partnership with Michigan Virtual University (MVU)
- Michigan Mathematics and Science Teacher Leadership Collaborative (MMSTLC)
- High School Math and Science Success-II (HSMASS-II)

See pages 5-10 for details about some of these programs.

DEVELOPING TEACHER LEADERS TO SERVE HIGH PRIORITY SCHOOLS through the Michigan Mathematics and Science Teacher Leadership Collaborative (MMSTLC)

Ninteen Centers are working in teams to support 58 mathematics and science Teacher Specialist Leaders to serve more than 200 of their math/science colleagues in about 35 targeted schools and more than 20,000 students.

MMSTLC is based on the belief that teacher leadership...
...occurs in and out of the classroom.
...begins with a focus on one's own content knowledge and classroom practice.
...involves improving one's leadership and communication skills.
...includes enlisting internal and external expertise and resources.
...transitions into engaging colleagues in classroom and school improvement efforts.
...can help transform school culture, classroom practice, and student learning.

IMPACTS AND OPPORTUNITIES: LEADERSHIP

Teacher Leader Networks are Developed

- Through the statewide Michigan Mathematics and Science Teacher Leadership Collaborative (MMSTLC), 8 core Math/Science Center-based teams began capacity-building in 2007-08 (Cadre I), continuing into 2008-09; an additional 11 teams began in the 2008-09 school year (Cadre II). Cadre I teams have received more than 125 hours of PD, including 60 hours devoted to math and science content and pedagogy and ~40 hours to building leadership skills. Cadre I Teacher Leaders and other Core Team Members implemented a total of 319 PD, student, or other MMSTLC activities at the Center/school level July 2007-June 2008, with a total of 14,236 hours provided and attendance of 4,388 across all activities.
- The Huron M/S Center trained middle school teachers in research-based strategies related to fractions, decimals, ratios, and percents. The training and support has been underway for two years as a way to improve student achievement in various content areas. This program is a partnership of schools in three counties. As a model, it seeks to maximize existing leadership potential of teacher leaders already employed in local school districts.
- The M/S Center Network continues to be a primary partner in the statewide Building a Presence in Science. Through this program, there are "Points of Contact" at most school buildings in Michigan who disseminate up-to-date information about science assessments, student programs, grade-level content expectations, and PD opportunities.

Centers Support Quality Teaching Experiences and Professional Development for Pre-Service Teachers

By collaborating with colleges and universities, Centers take a leadership role in ensuring that new teachers entering the field have relevant experiences and are well-prepared to meet Michigan's standards for teaching as well as the Grade Level Content Expectations and High School Course Expectations.

- Northern Michigan University students partnered with The Seaborg Center and conducted weekend College for Kids programs under the supervision of Center staff.
- Baker College students earned credits by helping elementary students conduct experiments at the Michigan Aerospace Challenge.
- The Central Michigan SMTC provided training on implementing Michigan's new K-7 Science Content Expectations and NASA educational workshops to in-service teachers and CMU pre-service teachers.
- The SVSU Regional M/S Center sponsors an undergraduate program to enrich the hands-on experience of future teachers in mathematics and science with alignment to Michigan Science and Mathematics Benchmarks.

Special Education and Regular Classroom Teachers Support Mathematics Achievement

Michigan Mathematics Program Improvement
This professional development opportunity for general education and special education teachers in grades K-8 included diagnostic inventories, manipulatives, activities, and assessments for interventions in the mathematics classroom. The workshop series addressed the needs of special education subgroups to achieve AYP and contributed to the achievement of all students through strong content and instructional professional development for school teams of special education and general education teachers. This example is from Allegan, EUP, Hillsdale, Jackson, Northwoods, and The Seaborg Center.

Centers have been collaborating with Michigan universities and colleges to develop professional development workshops, seminars, and courses for teachers, developing instructional units, and providing summer institutes for both students and teachers.

Universities and Colleges involved have included: Adrian College, Alpena Community College, Andrews University, Baker College, Central Michigan University, Eastern Michigan University, Ferris State University, Finlandia University, Grand Valley State University, Jackson Community College, Kalamazoo College, Kettering University, Lake Superior State University, Marygrove College, Michigan State University, Michigan Technological University, Muskegon Community College, Northern Michigan Community College, Northern Michigan University, Northwestern Michigan College, Oakland University, Saginaw Valley State University, Sienna Heights College, Spring Arbor University, University of Detroit-Mercy, University of Michigan, University of Michigan-Dearborn, University of Michigan-Flint, Wayne State University, West Shore Community College, and Western Michigan University.

CURRICULUM SUPPORT

Michigan Dept. of Education Priority:
"Helping low performing schools."

Mathematics and Science Centers Network Goal:
"Support principals in identifying the professional development needs of teachers, analyze MEAP data to identify instructional needs of students, and work with school improvement and curriculum development teams to align programming and instruction with state and national standards."

SUPPORT OF MICHIGAN'S GRADE LEVEL CONTENT EXPECTATIONS (GLCEs) and HIGH SCHOOL COURSE EXPECTATIONS

- Multiple sessions were provided to assist teachers in their understanding of Michigan's GLCEs.
- HSMASS-II, a statewide initiative, provided professional development to help 8th-12th grade teachers increase awareness and knowledge of the new High School Content Expectations and the math and science companion documents.

K-7 Science Grade Level Content Expectations Rollouts

Centers across the state facilitated the rollout of the K-7 science GLCEs. Participants received a variety of materials and activity suggestions to support GLCE implementation in their classrooms.

PROFESSIONAL DEVELOPMENT SUPPORTING CURRICULUM ALIGNMENT WITH STATE STANDARDS

- The Macomb County Math/Science Center developed the M-GLAnCE modules (Michigan Grade Level Assessment and Content Expectations). This program provides professional development for K-8 teachers focused on grade-level assessment related to content expectations. The Macomb County Mathematics Curriculum Guide supporting M-GLAnCE is being distributed statewide.
- The Hillsdale-Monroe-Lenawee M/S Center developed an 8th grade science course aligned with the Earth Science High School Content Expectations. Training was provided to assist educators as they incorporated Earth Science into the high school course sequence as an eighth grade class. This training included a facilitated curriculum mapping session, as well as modeling exemplary Earth Science lessons and activities.

USING ASSESSMENT TO IMPROVE INSTRUCTION AND CURRICULUM

Centers continued to work with districts on data analysis. At the Eastern Upper Peninsula Math/Science Center, regional, district, and classroom level data, analyzed by the Center, is provided annually for use by School Improvement teams, administrators, and teachers throughout the region. These materials have been particularly useful in designing targeted interventions in high priority schools.

The Manistee, Wexford-Missaukee Regional M/S Center provides data analysis for each building and district in the service area. Positive outcomes include teachers analyzing data, using a team approach to research, and understanding scientifically-based research.

CURRICULUM SUPPORT FOR HIGH PRIORITY SCHOOLS

Almost half of the Centers in the Network have been key partners in Michigan's Math/Science Partnership Grants. These grants focus on preparing teachers from high priority districts (underachieving, disadvantaged, or extreme rural) to teach curricula aligned with the GLCEs and High School Course Expectations.

IMPACTS AND OPPORTUNITIES: CURRICULUM SUPPORT TO LOCAL SCHOOL DISTRICTS

Support science and math achievement in identified high priority schools

- The Berrien M/S Center continued to work with middle school teachers in the Benton Harbor Area Schools, Benton Harbor Charter School, and Buchanan Middle School to improve student achievement in mathematics. This work included professional development in content and pedagogy through intense summer institutes, school year curriculum professional development and lesson study. The Center was awarded a Title II Mathematics and Science Partnership grant in collaboration with Andrews University to specifically raise student achievement through increasing the skill of middle school mathematics teachers.
- This year, EUP M/S Center staff members joined with EUPISD Curriculum Consultants in ELA and Social Studies to create profiles of each district and work as teams to support initiatives outlined in each district's school improvement plan. Each district is provided with a disaggregated data profile to help identify specific subpopulations that may be at greater risk and, therefore, require additional intervention strategies or programming.

Assist districts with statewide math and science test alignment and analysis

- Centers around the state are supporting districts in aligning curriculum, instruction, and assessment to state standards. For example, the Battle Creek Area M/S Center has saved Battle Creek Public Schools significant expense because they have worked to align the curriculum with the new science GLCEs.
- At COOR M/S Center, one-third of the local LEAs engaged in "unpacking" the new science content expectations and followed up with pacing guides, alignment, and initial development of common assessments.
- An increasing number of schools engage in the analysis of assessment data, goal setting, instructional improvement, and alignment of curriculum to state and national standards, because of the work of Centers across the state.

Facilitate the integration of technology into the math and science curriculum

- All Centers are supporting the integration of technology into math and science lessons.
- At Dickinson-Iron-Menominee M/S Center, teachers from all districts in the service area were trained to use "clickers" for classroom assessment.
- The Mason-Lake Oceana M/S Center worked intensively with area schools. The initial spring 2008 kick-off day combined technology resources with instructional strategies and fun techniques for teaching general mathematics concepts.
- The Allegan M/S Center offered several after school workshops on how to use hand-held technology and software/freeware to support students having difficulty succeeding in Algebra and Geometry.

Assist MDE with math and science initiatives

- Schools are more aware of state mathematics and science initiatives, changes in state assessment, and policy changes because of Centers networking with teachers and administrators.
- High School Math and Science Success-II (HS MASS-II) was a statewide project providing professional development and other services to teachers and schools to improve the teaching and learning of mathematics and science and improve teacher knowledge and pedagogical skills related to classroom (formative) assessment. Over 1,200 8th-12th grade teachers and 21,000 students participated in the project in the 2007-08 school year.

COMMUNITY AND PARENT ENGAGEMENT

NCLB goal:
"Partnering with parents and communities."

Michigan Mathematics and Science Centers Network Goal:
"Engage businesses, universities, museums, governmental agencies, and parents in supporting and providing quality mathematics and science education and experiences."

Business/Industry/Agencies have collaborated with Centers to provide:

- "Teacher in Industry" internship experiences
- Student internships in technical fields such as medicine, information technology, website design, engineering, architecture, aviation, pharmacy, dentistry, veterinary medicine, and forensic science
- Career talks by business professionals
- "Real-World" application of research projects such as water monitoring
- Mentoring and job shadowing experiences for students
- Used office furniture, scientific equipment, and supplies for schools

Examples of Partnerships with Foundations

- The Van Buren Research and Development Foundation has contributed funds to support the participation of Van Buren ISD districts in Eco Races.
- At Regional M/S Center (GVSU) each summer eighty 7th grade girls attend a free, four day camp for an engineering design and manufacturing experience and to encourage them to take higher level mathematics and science courses in high school. Generous corporate, community, and foundation support has provided funds totaling approximately $435,000 over the past seven years.
- Using grant funds from the Detroit Edison Energy Foundation, the Huron M/S Center trained middle school teachers in research-based strategies related to fractions, decimals, ratios, and percents.

Partnerships With Other Institutions and Organizations

- Centers have collaborated with over 30 Michigan universities and colleges to plan teacher and student programming, write grants, and share resources.
- Over 14 museums and planetariums have shared programming with Centers.
- Centers have provided programming and consultation to environmental/outdoor education centers across the state.
- Centers have involved the public libraries, National Park Service, Pictured Rocks National Lakeshore, the Michigan Department of Natural Resources, the U.S. Fish and Wildlife Service, the U.S. Forest Service, Conservation Districts, and Watershed Councils in M/S Center programs to benefit teachers and students.

Through Centers' efforts, professionals in the community are assisting with student research projects, Science Olympiads and science fairs, career presentations, and mentoring.

EXAMPLES OF ENGAGING PARENTS AND OTHER COMMUNITY MEMBERS

Many Centers organize Family Math and Science Nights and community education classes designed to engage parents and students in hands-on, inquiry-based activities. These programs build parents' awareness of and familiarity with inquiry-based teaching and learning that students are participating in at school.

IMPACTS AND OPPORTUNITIES: ENGAGING PARENTS AND COMMUNITIES

M/S Centers collaborate with community groups to co-sponsor math and science programs

- At Berrien M/S Center, individual community members and organizations are active in Science Olympiad, the Arts & Science EXPO, and the Regional International Science and Engineering Fair.
- The Battle Creek Area M/S Center is working with the New Level Sports after-school program for inner-city students in high-priority schools. Surveys show increased interest in math and science as a career.

Community groups are involved in planning and implementing programs

- The Jackson M/S Center, in collaboration with the Jackson Area Career Center, is working with local schools to implement Project Lead the Way curriculum in Jackson County. Currently, Introduction to Engineering and Principles of Engineering courses are being taught.
- The Western U.P. M/S Center brought together businesses, community organizations, local educators and Michigan Technological University faculty to secure funding from the Great Lakes Fishery Trust to implement the Lake Superior Stewardship Initiative, which will engage schools in community -based learning opportunities.
- Advisory boards of Centers bring human and financial resources as well as many opportunities for collaboration. Board members come from higher education, informal science institutions, K-12 schools, businesses, civic organizations, medical institutions, and industry. They share messages about mathematics and science education with their organizations and they brainstorm ideas, network, and exchange resources.

Parents are more engaged in school activities

- At COOR, parents are actively involved in summer programs sponsored by Centers.
- There is increased parent involvement at science and math fairs. (This example from the GVSU M/S Center.)
- At the Jackson M/S Center, parents are engaged as essential partners in the learning process and benefit from the parent workshops in mathematics and science provided by Centers.
- Parents are engaged as essential partners in the learning process and benefit from the parent workshops in mathematics and science provided by the Detroit M/S Center. The Center also provide support for Family Math and Science Nights in elementary and middle schools.

Financial and human resources are acquired to provide the six basic services

- Allegan M/S Center and US 131 Motor Sports Park partnered together to provide an authentic venue for the Center's Eco-Races.
- Community and business support of Battle Creek Area M/S Center science kit program: $102,000 raised in 2007-08.
- At Regional M/S Center at GVSU, contributions in 2007-08 year included GE Aviation's support for Michigan Science Olympiad (MSO) through a financial contribution of $3,000 and providing event supervisors for a robotics event.
- Centers across the state are receiving financial and in-kind support from area businesses, organizations, and agencies because of increased awareness of the importance of math and science.

Public understanding of the goals and issues of math and science education is promoted

- A community science festival is held twice a year at AMA M/S Center Sprinkler Lake Outdoor Center (Alpena Area). Over a thousand people attend these festivals annually, providing opportunities to increase awareness of science in their everyday lives.
- In the Lansing area, the Girls Math/Science Conference is held for sixth grade girls and their parents. The conference gives them resources to make informed choices about math and science careers and classes (example from Capital Area M/S Center).
- Centers maintain working relationships with their area news media. Frequent newspaper articles describe M/S Center programs and keep the community aware of the Centers.

RESOURCE CLEARINGHOUSE

In what ways are Center resources being used to support best practices in mathematics, science, and technology education?

M/S Centers support schools in the use of technology by:

- Providing training for integration of technologies.*
- Developing partnerships with industries to secure equipment such as graphing calculators, scientific probes, and other lab equipment that would otherwise be cost-restrictive.
- Allowing teachers to copy materials and borrow printed resources, videos, kits, and manipulatives required for classroom activities in particular science and/or mathematics curricula.

*Detailed numbers of hours, enrollments, and technology-focused sessions can be found in the Appendix, pages 28-30.

Maintenance and expansion of resources for local school districts

- M/S Centers are a dissemination point for several organizations including MCTM, MSTA, and MDSTA.
- Resource libraries are maintained by Centers, many of which are accessible through M/S Center websites.
- M/S Centers play an active role in the development, distribution, and maintenance of inquiry-based mathematics and science kits statewide. In addition, M/S Centers provide training and in-classroom support for using the kits or other equipment and instructional materials available on-loan from the Centers.

Centers create and sustain an Internet presence to support mathematics and science education

MVU Partnership— The M/S Centers Network partnered with Michigan Virtual University (MVU) to offer a unique computer-based learning program for middle school students. Virtual Science and Math Camps allowed students to enhance their science and math skills through the use of technology.

Building a Presence in Science - This national network connects science teachers across Michigan to provide them with information about professional development opportunities and science teaching resources.

At the Wayne RESA M/S Center, a science test question generator for developing common assessments is available online for teachers in the service area. "Live365," an internet-based science music station that plays science songs and can be accessed by students or teachers, was also supported by Wayne RESA M/S Center.

At the Allegan M/S Center, teachers participating in PD exhibited on-going communication outside the workshop structure through Moodle, a free, online communication and resource clearinghouse tool. Teachers could go to Moodle to get lessons, information, instructional strategies and other resources, and to post questions.

Centers actively recruit businesses and industries to support mathematics, science, and technology education through donation of equipment, facilities, and supplies. Some of these are used in Center programming but a major focus is the loaning and distribution of these materials and equipment to area schools. Financial resources are often used to support special events such as science fairs, academic competitions, and mathematics and science camps. Some examples of the businesses and industries that have supported Centers in the past year include:* Battle Creek Unlimited, Borgess Hospital, Bronson Hospital, Curious Kids Museum, DENSO, DOW, Flint Cultural Center, GE Aviation, HARSCO, Howmet Castings, Judd LLP, Kellogg's, Longway Planetarium, New Page Corporation, Nordland and Associates, Perrigo Company, Pfizer, PVS Nolwood, Smiths Aerospace, Warner Norcross, and US 131 Motor Sports Park.

* Not a complete list.

IMPACTS AND OPPORTUNITIES: RESOURCE CLEARINGHOUSES MAINTAINED AND COORDINATED BY M/S CENTERS

M/S Centers provide access to quality materials and equipment for the classroom that otherwise would not be available.

Technology

- Centers provide technology resources (along with training) and other materials to supplement and enhance lessons. Online access to resource inventories is available on many Centers' websites. The number of teachers using technology to access materials and to support curriculum and instruction continues to increase.
- At the Muskegon Area M/S Center, REsources for Authentic Learning in Science (*REAL* Science) is a community partnership established to purchase modern scientific instruments and provide teacher training and support to ensure a powerful, real-world science experience for all students. School participation has resulted in teachers being more prepared to design and deliver real-world learning experiences for their students. Students, in turn, will be better prepared for the workforce and to enter STEM (science, technology, engineering, and mathematics) programs at universities.

Science Kits

- School districts across the state use the K-6 Science Curriculum/Kit program developed by the Battle Creek Area Mathematics and Science Center. BCAMSC provided materials to over 4,300 classroom teachers.
- Science kit use is facilitated and supported by M/S Centers (examples from Battle Creek, GVSU, Lapeer, Mason-Lake-Oceana, Sanilac, SEE-North). BCAMSC revised K-3 science units for all students in their service area as well as 25% of Michigan school districts.

StarLab throughout Michigan

Several Centers trained teachers to use StarLab in their schools and districts. StarLab is an interactive portable planetarium that creates an ideal environment for hands-on activities. After training, teachers have free use of the StarLab for their school. Thousands of students are able to learn about the solar system through this service. Centers involved with the StarLab program include CMU, Huron, Lapeer, Macomb, Seaborg and Wayne.

Other Resources

- NASA resources and workshops provide in-service and pre-service teachers access to resources and strategies for integrating math, technology, and social studies with science. These are available through several Centers (e.g. CMU, Dickinson-Iron, Genesee, Seaborg, SVSU).
- Centers have facilitated the donation (and dissemination) of lab equipment and supplies to districts from other agencies and industries.
- Many Centers have an equipment loan program that has provided direct material support to schools throughout the state. Schools can borrow StarLabs, LEGO robotics kits, classroom GPS sets, data collection probes, as well as numerous other types of equipment to support classroom instruction.

Communities have access to resources provided for and developed by Centers.

- Families have access to high-quality accelerated mathematics and science programs for students that often are only available in wealthy areas. There are eight accelerated high school programs facilitated by Centers across the state (Battle Creek, Berrien County, Detroit, Kalamazoo, Macomb, Mecosta, Oakland, and Sanilac).
- Communities have access to outdoor education centers supported by M/S Centers. Outdoor education centers include SEE-North Center for Outdoor Studies, AMA Sprinkler Lake Outdoor Center, Huron Nature Center, Northwoods Clear Lake Education Center, and Flint Ligon Outdoor Education Center.

LEVERAGED RESOURCES

Funding Crisis: For the fifth year in a row, the Michigan Mathematics and Science Centers have experienced a major funding set-back. The foundation grant from the State of Michigan was cut 75% by the Legislature in the 2002-2003 school year. Never before has the leverage of funds from other sources been so important. To compound the problems, grant acquisition has become more challenging with reduced staff and lack of available matching funds required by many funding agencies. In addition, local school districts have fewer funds available to support teachers to attend professional development or support other services of the Centers. Many Centers are only holding on "by a thread." Without leveraged resources, several would have to cease providing programs and services.

Examples of Resources Leveraged Through Collaborations with Universities and Colleges

- Collaborations with state universities to sponsor full-day regional mathematics and science conferences
- Inclusion of pre-service teachers in science, mathematics and technology content professional development courses offered to districts
- Teacher Quality Grants (Title II, Part A) are developing science leaders in underachieving schools and building teachers' science content knowledge
- Partnership with universities and school districts result in proposals for the Mathematics and Science Partnership Grants (Title II, Part B)

In the past year, Michigan Mathematics and Science Centers have leveraged an additional $7,909,955 from grants and community contributions.

Intermediate School Districts and Universities have contributed approximately $2,735,551 toward salaries and $766,836 toward Centers' general funds. A large portion of these contributed funds represent Title II, Part B funds or payment for general education services.

EXAMPLES OF LEVERAGED SUPPORT

- Allegan M/S Center received a $3,500 DeLano Foundation grant to increase the number of students who can participate in the annual Eco Races, an event that allows high school students to design, build, and race model solar-powered cars.
- Battle Creek Area M/S Center raised community and business support of the science kit program. $102,000 was raised through business and industry in 2007-08.
- GE Aviation contributed $3,000 to support the Michigan Science Olympiad, organized by the GVSU Regional M/S Center.
- Local businesses supported the Science Olympiad Tournament hosted by the Seaborg Center at NMU. Contributions of $5,000 allowed students to attend at no cost. The Seaborg Center also received $6,000 from Kaleidoscope, a community group, to support the StarLab program. The funds were used for professional development using the StarLab.
- Students who are enrolled in the Allegan Tech Center's Electro-Mechanical Program have opportunities to solve real-world audio-engineering problems through the Project X Why Z that was funded by the Convergence Education Foundation and was co-written by Center staff. The program received its annual installment of $10,000 ($45,000 total) for the purchase of audio testing and diagnostic equipment to support classroom learning.

APPENDIX

MEETING STATE AND NATIONAL GOALS

The M/S Centers Network serves as a catalyst and resource for improvement of the teaching and learning of mathematics and science. Centers provide services within their region that enhance and extend beyond those available to local districts. A major focus of their work is supporting schools in meeting the strategic goals of the State Board of Education, the priorities of the Michigan Department of Education, and the goals of No Child Left Behind (NCLB).

The table below illustrates the correlation of the Michigan Mathematics and Science Centers Network goals with state and national goals.

Michigan Department of Education School Improvement Framework Performance Indicators	**No Child Left Behind** (major goals)	**Michigan Mathematics and Science Center Network Goals**
Highly qualified personnel who continually acquire and use skills, knowledge, attitudes, and beliefs necessary to create a culture with high levels of learning for all.	Preparing high quality teachers.	Provide professional development opportunities that enable and sustain effective teaching in mathematics and science, by keeping teachers current in the field and able to develop positive learning environments for all students.
Staff participates in learning teams; professional learning is conducted with colleagues across the school/district on improving staff practices and student achievement.	Preparing high quality principals.	Provide Teacher Leader programs to develop expertise at a building level in content, pedagogy, assessment and other essential components to teaching high standards. Support principals in their efforts to improve math and science in their schools.
Staff has the professional technology skills to be effective in their positions.		Facilitate and model the integration of technology into the mathematics and science curriculum.
Best practice instructional methods are used to facilitate student learning.	Requiring schools to use research-based instructional programs.	Facilitate the integration of research-based instruction and best practices into the content areas of mathematics and science.
The school and community work collaboratively and share resources in order to strengthen student, family, and community learning.	Partnering with parents and communities.	Engage businesses, universities, museums, governmental agencies, and parents in supporting and providing quality mathematics and science education and experiences.

SUPPORTING MICHIGAN DEPARTMENT OF EDUCATION PRIORITIES

A major focus of the M/S Centers Network in 2007-2008 has been to support the development and dissemination of Michigan's new Grade Level Content Expectations (GLCEs) in both mathematics and science as well as supporting high school reform efforts. Support has ranged from serving on advisory teams, reviewing GLCEs, and providing workshops for teachers and administrators to become familiar with the GLCEs. Work with teachers has begun in developing mathematics lessons and assessments that are aligned with the GLCEs. Centers focused on familiarizing teachers and then students with the ACT and MME student assessments through a series of teacher professional development sessions in Winter 2008. Special effort has been made to work with high priority schools.

The Network also supports the Michigan Department of Education's priorities in the following ways:

Michigan Department of Education Priorities and Activities	**No Child Left Behind** (major goals)	**Michigan Mathematics and Science Center Network Goals**
Continue collaboration between general education (including special education) and career and technical education for curriculum alignment and applied learning instructional strategies.	Improving accountability. Providing evidence of effectiveness. Planning evaluation.	Support principals in identifying the professional development needs of teachers, analyzing MEAP data to identify instructional needs of students, and working with school improvement and curriculum development teams to align programming and instruction with state and national standards.
Attain substantial and meaningful improvement for all students with primary emphasis on high priority schools and students.	Improving the academic achievement of the disadvantaged.	Provide opportunities to under-represented students to improve achievement in mathematics and science.
Continue to provide a forum for sharing best practices that help schools be successful with all students, particularly in the area of math, including differentiated and project-based learning and student centered environments.	Promoting innovative programs.	Provide accelerated mathematics and science programming to motivated math and science students (with a focus on recruiting under-represented students); provide teacher professional development using research-based instructional strategies.

Michigan Mathematics and Science Centers Network
Data Tables 2007-2008

PROFESSIONAL DEVELOPMENT

Table 1: Professional Development Participants

			Reported Gender**		Position					
Patici-pants	Different No. of Indiv.	Total Hours	Males	Females	Admin.	Math Tchrs.	Science Tchrs.	Tech Tchrs.	Com-bined Subject	Other or Un-known*
Pre-K	201	2,145.25	10	191	6	6	0	0	143	46
Elemen-tary	4,289	45,496.7	487	3,742	141	94	184	15	3,410	445
Middle/Jr. High	2,315	37,682.3	600	1,646	84	822	817	19	166	407
High School	2,523	40,247.7	1,089	1,384	98	816	847	50	104	608
Others*	2,789	37,639.8	705	1,814	249	250	296	43	328	1,623
Total	12,117	163,211.8	2,891	8,777	578	1,988	2,144	127	4,151	3,129

*Other includes persons who work across levels, are not teachers or administrators, or did not indicate position.
** 3.7% of individuals did not indicate Gender.

Teachers averaged 13.5 hours of participation in Center programming during the 2007-2008 academic year.

WHAT WERE THE NATURE AND EXTENT OF THE PROFESSIONAL DEVELOPMENT ACTIVITIES?

Professional development was delivered in many ways, depending on the identified needs in the service area. Two primary formats included: (1) single events, lasting from a portion of one day to several consecutive days, and focused on a particular topic, skill, or issue, or (2) series—a series of sessions with a single focus, conducted periodically over a several week/month period.

Table 2: Professional Development Activities

		Math	Science	Technology	Integrated M/S/T	Other	Total
Pre-K	Events	1	0	0	0	0	1
	Hours	7.5	0	0	0	0	7.5
	Participants*	9	0	0	0	0	9
Elementary	Events	171	177	5	1	29	383
	Hours	868.75	731	18	0.5	105.75	1,724
	Participants*	2,975	2,082	140	10	362	5,569
Elementary & Mid/Jr. High	Events	98	98	2	0	14	212
	Hours	483.25	605.5	36	0	104	1,228.75
	Participants*	1,669	1,920	25	0	179	3,793
Mid/Jr. High	Events	177	110	4	0	42	333
	Hours	997.75	738.25	15	0	163.45	1,914.45
	Participants*	2,428	1,459	58	0	672	4,617
Mid/Jr. High & High School	Events	116	50	8	10	23	207
	Hours	739.15	381.5	33.5	57.5	82.25	1,293.9
	Participants*	1,425	685	102	224	339	2,775
High School	Events	106	140	11	16	59	332
	Hours	763	684.5	47.5	74.25	211.5	1,780.75
	Participants*	1,413	1,843	147	169	743	4,315
K-12 Mixed Levels	Events	109	82	83	2	105	381
	Hours	919.5	547	326	4	508	2,304.5
	Participants*	2,584	1,558	1,150	60	2,568	7,920
Total	Events	778	657	113	29	272	1,849
	Hours	4,778.9	3,687.75	476	136.25	1,174.95	10,253.85
	Participants*	12,503	9,547	1,622	463	4,863	28,998

*Includes duplicate counts (Individual participants enrolled in more than one program).

Table 3: Student Services Activities

		Math	Science	Technology	Integrated M/S/T	Other	Total
Pre-K	Events	3	4	0	0	0	7
	Hours	15	18	0	0	0	33
	Participants	45	77	0	0	0	122
Elementary	Events	28	466	8	0	10	512
	Hours	132.75	2,104.4	125	0	30.5	2,392.65
	Participants	3,009	29,030	136	0	609	32,784
Elementary & Mid/Jr. High	Events	22	46	14	1	2	85
	Hours	337	919	248	1	17	1,522
	Participants	22,804	7,760	376	119	181	31,240
Mid/Jr. High	Events	51	70	6	19	12	158
	Hours	308	623.75	267	25	71	1,294.75
	Participants	3,084	7,513	372	1,819	2,151	14,939
Mid/Jr. High & High School	Events	5	27	6	1	3	42
	Hours	199	340	215	1	40	795
	Participants	57	3,827	76	204	53	4,217
High School	Events	13	82	4	1	12	112
	Hours	101.5	7,244.4	136	3	60	7,544.9
	Participants	879	3,232	138	42	1,242	5,533
Other Mixed Levels	Events	1	40	0	0	3	44
	Hours	1	288.25	0	0	6	295.25
	Participants	1,000	18,950	0	0	90	20,040
Total	Events	123	735	38	22	42	960
	Hours	1,094.25	11,537.8	991	30	224.5	13,877.55
	Participants	30,878	70,389	1,098	2,184	4,326	108,875

For more descriptive information regarding individual Center programming, see individual Center Reports. These can be obtained by contacting individual Center Directors (see page 32). The Network website also gives additional information: www.mimathandscience.org.

Table 4: Ten Year Summary Data

SUMMARY OF PROFESSIONAL DEVELOPMENT ACTIVITIES 1998-2008

School Year	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007*	2007-2008*
Total PD Programs Offered	2,186	2,549	2,765	3,436	3,239	1,705	1,928	1,725	2,036	1,849
Total PD Program Hours	16,158	14,059	13,067	14,757	14,563	10,507	11,057	11,109	11,933	10,253.85
Total PD Enrollments	40,160	43,655	47,210	21,904	51,527	28,540	34,237	26,484	30,271	28,998
Percent PD Science-Focused Programs	32%	42%	40%	43%	36%	41%	31%	41%	40%	36%
Percent PD Math-Focused	18%	17%	21%	23%	27%	30%	41%	45%	45%	42%
Percent PD Technology-Focused	1%	9%	11%	7%	8%	15%	7%	4%	5%	6%
Percent PD Integrated M/S/T	47%	19%	18%	15%	13%	1%	0%	1%	1%	1%
Percent PD Other	2%	13%	11%	12%	15%	14%	21%	9%	9%	15%

*Total PD activities were positively impacted by a special earmarked allocation from the Michigan Legislature to fund a statewide PD effort.

SUMMARY OF STUDENT ACTIVITIES 1998-2008

School Year	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Outreach Sessions	5,110	6,763	6,514	6,990	5,024	1,252	1,579	1,112	1,119	960
Outreach Hours	49,171	46,403	52,879.3	159,952	109,815.5	37,893.5	19,151.35	15,983	17,940	13,877.5
Outreach Participants	250,817	251,251	263,292	309,716	374,813	239,984	206,906	287,047	160,220	108,875

NOTE: The program data above represent a significant decline in the level of activities offered to teachers and students, the number of programming hours offered, and the number of enrollments in programs beginning in 2003-04 This was the year that Centers received a 75% reduction in their base funding from the Michigan Legislature. **This clearly suggests that the reduction has significantly impacted the quantity and accessibility of mathematics and science programming for Michigan's students and teachers.**

However, M/S Centers have focused their efforts on providing high quality professional development to ensure teachers are highly qualified and using best practices. Due to leveraged grant monies and a special allocation from the Legislature, professional development programming hours have only been reduced by 43% since 2002-03 despite the 75% cut in core funding. **Unfortunately, the number of student programming hours since 2002-03 have been reduced by 81% due to funding cuts.**

DIRECTORY OF MICHIGAN MATHEMATICS AND SCIENCE CENTERS

Center Name	Contact Person	Telephone
Allegan County M/S Center	Amy Oliver	(269) 686-5087
AMA/IOSCO M/S Center	Tracy D'Augustino	(989) 354-3101
Battle Creek Area M/S Center	Connie Duncan	(269) 965-9440
Berrien County M/S Center	Dennis Lundgren	(269) 471-7725
Capital Area Sci/Math Center	Julie Fick	(989) 224-6831
Central Michigan SMTC	Kaye Hemerline	(989) 774-3573
COOR S/M Center	Don Mick	(989) 275-9562
Detroit M/S Centers	Nancy Varner	(313) 873-0225
Dickinson-Iron-Menominee M/S/T Center	Dee Benjamin	(906) 776-8137
EUP M/S Center	Valerie Masuga	(906) 632-3373
Genesee Area M/S/T Center	Larry Casler	(810) 591-4470
Grand Traverse Regional M/S/T Center	Tom Wessels	(231) 922-7875
Great Lakes M/S Center	Gus Bishop	(231) 547-9947
Hillsdale-Lenawee-Monroe M/S Center	Pam Bunch	(517) 265-6691
Huron M/S/T Center	Scott Whipple	(989) 269-3473
Jackson County M/S Center	Denise Belt	(517) 768-5223
Kalamazoo Area M/S Center	Brenda Earhart	(616) 337-0004
Lapeer County M/S Center	Larry Casler	(810) 667-6495
Livingston/Washtenaw M/S Center	Nicole Garcia	(734) 994-8100
Macomb County M/S/T Center	Mike Klein	(586) 228-3467
MAISD Regional M/S Center	David Krebs	(231) 767-7317
Manistee, Wexford-Missaukee Regional M/S Center	Karen Mlcek	(231) 876-2263
Mason-Lake-Oceana M/S Center	Kathy Surd	(231) 757-4934
Mecosta-Osceola M/S/T Center	Mary Ann Robinson	(231) 796-3543
Northwoods M/S/T Center	Tom Abramson	(906) 786-9300
Oakland Schools S/M/T Center	LaMoine Motz	(248) 209-2378
Regional M/S Center (GVSU)	Karen Meyers	(616) 331-2265
Saginaw Valley State Univ. Regional M/S Center	David McCloy	(989) 964-4114
Sanilac County S/M Center	Brian Derowski	(810) 648-4700
The Seaborg Center- NMU	Debra Homeier	(906) 227-2002
St. Clair RESA M/S Center	Terry Parks	(810) 364-8990
Wayne RESA, M/S Center	Libby Pizzo	(734) 334-1375
Western U.P. M/S Center	Shawn Oppliger	(906) 482-4520