

Mason-Lake Oceana Mathematics and Science Center 2009-2010 Annual Report

The mission of the Mason-Lake Oceana Mathematics Center (MLOMSC) is to foster the cooperative effort of educators, business and industry, and the community to improve mathematics, science, and technology education for both students and educators. It serves an area of 1,175 square miles in the western lower peninsula of Michigan. MLOMSC serves nine local school districts and four private schools: Baldwin, Free Soil, Hart, Ludington, Mason County Central, Mason County Eastern, Pentwater, Shelby, and Walkerville school districts; Ludington Area Catholic; New Era Christian; Oceana Christian; and Covenant Christian. The Center's partners include the Mason-Lake ISD, Oceana ISD, and West Shore Community College.

Overview of the Year's Accomplishments

Maintaining quality programs is a priority for the Mason-Lake Oceana Mathematics and Science Center. Some of the programs that we continue to sustain include: MATHCOUNTS, Hands-On Science, You Be The Chemist, The WSCC Collaborative Physics Program, Mathematics and/or Science Summer Camps, KeyTrain Tutorial at CTE, and K-12 Professional Learning Communities for Mathematics and Science. In addition to our annual projects, we are continually looking to expand our programs and provide appropriate services based on the needs of our districts. We have had a number of new projects this school year; many of which we have collaborated with other organizations to maximize impact and leverage additional resources.

- In collaboration with the special education department at Mason-Lake ISD, we developed a plan to bring more technology into the classrooms of our local schools. More information is available on page 3.
- This was the first year we collaborated with the Michigan Green Schools organization. Six schools from our service area were awarded the Michigan Green Schools designation. These schools received a flag and a certificate signed by the governor. Beginning this collaboration brought us closer to our local environmental organizations such as AFFEW.
- This was the second year for our 3-year "Methods for Reaching Mastery in Mathematics" program. This school year, we updated our common mathematics assessments to reflect the number of questions on the MEAP, based on the core and extended designations. We have also updated our assessments to be part of the Data Director system. This system allows teachers to get instantaneous results of their student's achievement. It also allows the data to be stored and retrieved by other teachers in the future so instruction can be based on a student's need.
- The Center has assisted our local schools in writing grants. More information about helping schools to write grants is on page 3.
- In partnership with the Ottawa ISD, we provided support for our local schools to pilot a mathematics Rtl program. Five schools from our service area were selected by Ottawa ISD to pilot the program in the spring of 2010. The data received from this pilot assists local schools in targeting students in greatest need of additional assistance. Furthermore, it has assisted local schools in identifying areas which could be targeted in summer programs.
- We made a stronger effort to support our special needs students this year. We've met with counselors and principals regarding changes in the personal curriculum and mathematics requirements for graduation. We provided training in "assisting struggling students in mathematics" for middle school mathematics and special education teachers.

Organization of the Report

The Strategic Plan identifies six service areas: Leadership, Professional Development, Student Services, Curriculum Support, Community Involvement, and Resource Clearinghouse. This report will focus on Professional Development and Student Services for the entire service area. In addition, there will be narrative targeting work done with underachieving schools in the area.

REGION-WIDE PROFESSIONAL DEVELOPMENT

Goal: For educators who participate in Center Professional Development to reflect best instructional practices in their own settings.

Who participated in the professional development?

Professional development opportunities were provided for classroom teachers, classroom support staff, administrators, parents/community members, and others involved in K-12 education. The table below describes who participated.

Table 1: Participants Receiving Professional Development

Participants	# of Individ.	Total Hours	Reported Gender**		Position					
			M	F	Admin	Math Tchr	Sci Tchr	Tech	Comb Subj	Other or Unknown*
Pre-School	10	183.25	1	9	1	0	0	0	5	4
Elementary	200	2772.75	22	175	9	2	0	0	154	35
Middle/Jr. High	64	1229.75	20	41	4	8	11	0	2	39
High School	132	1592.5	77	49	4	19	14	7	3	85
K-12 Mixed Levels	85	1126.75	29	51	10	2	4	3	15	51
Other*	41	353	13	26	2	0	0	0	3	36
Total	532	7258	162	351	30	31	29	10	182	250

* Other includes persons who work across levels, are not teachers or administrators, or did not indicate position.

**Gender was not reported by all individuals.

Professional development was delivered in many ways, depending upon the identified needs. Two primary formats included: (1) **Single events**, lasting for a portion of one day to several consecutive days, focused on a particular topic, skill, or issue; and (2) **Series**, which were a series of sessions (one building on the previous one and conducted periodically over a several week/month period). The goal was to systematically strengthen teaching practices based on local needs and current research. Table 2 on the following page represents a picture of the number of sessions offered and the rate of attendance.

Teachers, on average, spent 13.6 hours on mathematics, science, or technology professional development.

Table 2: Professional Development Activities

		Math	Science	Technology	Other	Total
Pre-K	Events	0	1	0	0	1
	Hours	0	6	0	0	6
	# Participants	0	19	0	0	19
Elementary	Events	15	23	0	3	41
	Hours	48.25	100	0	11	159.25
	# Participants	476	297	0	3	776
Elementary & Jr. High	Events	5	1	0	1	7
	Hours	20.25	1	0	4.5	25.75
	# Participants	42	3	0	1	46
Middle School	Events	7	5	0	3	15
	Hours	30.25	23	0	13	66.25
	# Participants	61	44	0	16	121
Jr. High & High School	Events	9	4	0	1	14
	Hours	45.5	13.5	0	2	61
	# Participants	133	25	0	1	159
High School	Events	12	7	0	12	31
	Hours	48.25	19.5	0	24	91.75
	# Participants	154	84	0	128	366
K-12 Mixed Levels	Events	4	0	1	48	53
	Hours	17	0	5.5	150.75	173.25
	# Participants	60	0	13	727	800
Total	Events	52	41	1	68	162
	Hours	209.5	163	5.5	205.25	583.25
	# Participants	926	472	13	876	2287

Bringing Technology to the Classroom. In collaboration with the special education department at Mason-Lake ISD, we developed a plan to bring more technology into the classrooms of our local schools. Improving algebra instruction was identified by our local schools as being a high area of need in our service area. Through collaboration, we have been able to loan 422 TI-Nspire calculators, 18 TI-34 II calculators, 7 calculator carrying cases, 14 CBR-2 units, 4 TI-Nspire Navigator systems, 5 LCD projectors, 9 document cameras, 4 Vernier probes, and many batteries and bulbs to our local schools for algebra instruction.

Grant Writing Assistance. The Center has assisted our local schools in writing grants. One of our schools received a grant for a science summer camp; the GIST (Girls in Science and Technology) camp was developed in collaboration with our Math/Science Center and a local school. Many of our local school mathematics and science teachers have been writing MEEMIC grants, Community Foundation Grants, and various other mini-grants. We've worked with teachers on finding other funding sources, such as donorschoose.org. The lack of funding situation has created a need for us to assist our local districts with finding other ways to support themselves in promoting mathematics and science education.

Spotlight on Professional Development

In previous years, we provided many different kinds of professional development for mathematics and science. This year, we have tried to create a more focused approach to our professional development. Although fewer in title, many of these professional development opportunities came through multiple sessions. (Items with an * were multiple-day events.)

Elementary Math

- 1) Methods for Reaching Mastery in Mathematics (M³ Program)*
- 2) Curriculum Mapping*
- 3) Math Their Way*
- 4) In-District Mapping PD with Technology (Ludington)
- 5) Rtl (Hart, Walkerville, Ludington, Pentwater)*
- 6) In-District Assessment PD (Ludington, Baldwin)

Middle School Math

- 1) Methods for Reaching Mastery in Mathematics (M³ Program)*
- 2) Curriculum Mapping*
- 3) Professional Learning Communities*
- 4) Helping Struggling Students with Mathematics*
- 5) In-District PD (Hart MS)
- 6) Grading

High School Math

- 1) Assessment Correlation*
- 2) Algebra for All*
- 3) Professional Learning Communities*
- 4) Curriculum Mapping*
- 5) Technology for Algebra
- 6) Moodle
- 7) In-District PD (MCCHS)
- 8) E-MATHS Basics
- 9) ELAR Assessment Bank Training*
- 10) E-MATHS Series*

Elementary Science

- 1) Hands-On Science Kit PD for Kindergarten
- 2) Hands-On Science Kit PD for 1st Grade
- 3) Hands-On Science Kit PD for 2nd Grade
- 4) Hands-On Science Kit PD for 3rd Grade
- 5) Hands-On Science Kit PD for 4th Grade
- 6) Hands-On Science Kit PD for 6th Grade
- 7) Science Curriculum Mapping*

Middle School Science

- 1) Writing Across the Curriculum - Science
- 2) Curriculum Mapping*
- 3) Grading
- 4) Hands-On Science Kit PD for 6th Grade
- 5) Ideas for Teaching MS and HS Science

High School Science

- 1) HSMASS-IV*
- 2) Curriculum Mapping*
- 3) North West Michigan Chemistry Teachers Organization PLC*
- 4) Professional Learning Communities*
- 5) Ideas for teaching the Essential Chemistry and Physics Expectations
- 6) Ideas for teaching MS and HS Science
- 7) ELAR Assessment Bank Training

Administrators

- 1) High School Reform & Personal Curriculum Updates
- 2) Hands-On Science – Funding and Professional Development Series*
- 3) In-District Plans of Curriculum and PD*
- 4) Post-Secondary Options for Students

Counselors

- 1) Earning Math and Science Credits in CTE
- 2) High School Reform & Personal Curriculum Updates

Student Services

Student services are delivered based on identified needs to improve and enhance mathematics and science education. Students who participate in enrichment activities have the opportunity to explore new concepts, develop process skills, cooperate on group tasks, and discuss their findings. Student services include:

- ❖ School day programs including the KeyTrain tutorial at our Tech center
- ❖ organization of the regional Math Counts competition for middle school students
- ❖ organization of the regional You Be The Chemist competition for middle school students

Table 3: Student Services Activities Provided in 2009-2010

		Math	Science	Total
Middle School/Jr. High	Events	3	1	4
	Hours	17	2.5	19.5
	# Participants	184	97	281
High School	Events	2	2	4
	Hours	15	120	135
	# Participants	533	17	550
Total	Events	5	3	8
	Hours	32	122.5	154.5
	# Participants	717	114	831



Spotlight on Innovative Student Services

Since the closing of our high school pull-out program, we have had to find more creative ways to provide innovative student services for our region. Some of these innovative programs include the following:

- The West Shore Physics Collaborative – Since many of our schools are small, providing a high-quality physics program has been increasingly difficult. Sometimes the number of students signed up to take the class is so small that it is difficult to justify running the class. Sometimes, the teacher is already teaching five or six other science classes and adding an additional preparation to their day would be difficult. Sometimes, the teacher is highly-qualified on paper but feels less qualified to teach physics than other areas of science. Sometimes, the physics materials at the school are out-dated or are lacking. To resolve these issues, MLOMSC has worked with West Shore Community College to create a collaborative physics class. This class is taught by a college instructor who also happens to be highly-qualified to teach physics at the high school level. In structure, it is similar to taking a dual-enrollment class. The class has been scheduled the same time as the Tech Prep classes at West Shore Community College, so students can ride the same bus as the students enrolled in the Tech Prep classes and there are no additional travel costs for schools. The class is offered on Mondays, Wednesdays, and Fridays. On Tuesdays and Thursdays, a schedule has been created for students to take other college-level dual-enrollment classes. The instructor of the class has incorporated Moodle and other technology-related resources so students can stay “connected” and communicate via the Internet even when they are off campus.
- The KeyTrain Tutorial – Many schools are focusing on the ACT for their Michigan Merit Examination preparation. However, the WorkKeys part of the test is sometimes overlooked. By working with our local Career and Technical Education Center, MLOMSC has created a program for students at the Tech Center to review the material that would be part of the Applied Math and Locating Information sections of the WorkKeys test. Furthermore, this program typically aligns well with the applied learning that students encounter as part of their Tech Center curriculum. The KeyTrain tutorial makes explicit the mathematics that is naturally part of their Career Tech class. A schedule is set up each year for students from each Career Tech class to visit the computer laboratory to work on their Applied Mathematics and Locating Information skills.
- Mathematics Summer Camps – This summer, we offered a mathematics summer camp to middle school students. The topic for the camp was examining linear functions. The camp incorporated the use of the graphing calculator.
- We continue to work with our corporate sponsors to offer students various mathematics and science competitions. MATHCOUNTS is heavily supported by our local engineers. You Be The Chemist Competition is supported by Dow Midland. These competitions have increased students’ interest in mathematics and science. Furthermore, these competitions help students to “feel good” about being good at mathematics and science.

Spotlight on High Priority Schools

The Baldwin Community School District is the public school in our service area which has the highest need and typically has the lowest achievement levels as measured by the MEAP, MME, and graduation rates. We began a mathematics initiative with Baldwin in 2007. Since that time, we've been sustaining our commitment with Baldwin Community Schools through on-site professional development, collaborative professional development, in-district planning of initiatives, administrative support, curriculum support, course sequencing meetings, and assessment support. Since 2007, we've also worked with Baldwin on improving their science instruction through the use of our updated Hands-On Science Kits.

Recent MEAP data indicates that the Baldwin Community School District is making progress in their mathematics and science achievement. As indicated by the charts below, all grade levels are making gains in the number of students proficient on the MEAP. (The table shows the comparison of current 2009 MEAP data with data from before we began our initiatives with Baldwin in 2006.)

Percent of Baldwin Students Proficient on the Mathematics MEAP Test during 2006 and 2009

	3 rd Grade	4 th Grade	5 th Grade	6 th Grade	7 th Grade	8 th Grade
2006 MEAP	78%	74%	38%	26%	18%	43%
2009 MEAP	79%	85%	52%	71%	65%	46%

Percent of Baldwin Students Proficient on the Science MEAP Test during 2006 and 2009

	5 th Grade	8 th Grade
2006 MEAP	47%	33%
2009 MEAP	60%	45%

The curriculum mapping that was initiated last summer in Baldwin was reinforced this school year. Teachers either refined their maps from the previous summer or they created maps in other mathematics or science content areas that were not started last year. Some teachers have begun aligning their assessments by GLCE to their curriculum maps. At the K-8 level, Baldwin teachers were active members of our Methods for Reaching Mastery in Mathematics Program. At the high school level, their mathematics teachers were active participants in the Algebra for All professional development. At the middle school level, teachers were involved in our summer mathematics series.

The administration at Baldwin Community Schools has worked closely with the MLOMSC. Together, the past four summer academies for teachers were created along with professional development workshops offered throughout the year. The summer academy this year focused on science curriculum mapping.

The teamwork between MLOMSC staff, Baldwin teachers, and Baldwin administration has resulted in a much more comprehensive curriculum. Teachers at all grade levels (K-12) are gaining confidence in their ability to teach mathematics and science and to align their curriculum to the expectations.

The Value of Statewide Projects

Many of our schools are small and none have a full-time curriculum director. Few districts have an administrator who has a background in mathematics and science education. Statewide projects have had a positive impact on our area. Some of these include:

- The opportunity for our teachers to stay connected with new ideas in mathematics and science education.
- The opportunity for our Mathematics and Science Center to provide high-quality professional development which is consistent with larger areas of the state that typically have more human and material resources.
- The opportunity for our teachers to track growth in their students through the pre-made assessments delivered by SAMPI. These assessments give the teachers feedback on the effectiveness of the new techniques they are trying in the classroom. When statewide data is shared with teachers, they can see how well their students did relative to the state on the pre-determined student assessment.
- Creating statewide projects provides administrators with the reassurance that the professional development their teachers will experience is of high-quality. Administrators feel confident that the professional development their teachers are receiving is worthy of the time required outside of the classroom.
- Through these statewide initiatives, our teachers gain reassurance that what they are doing in the classroom is consistent with the intent of the High School Content Expectations and the Grade Level Content Expectations. As a result, our students receive a curriculum that is more tightly aligned to the intended expectations in Michigan.

Spotlight on Partnerships

Mason-Lake Oceana Mathematics and Science Center has been working with various organizations to promote mathematics and science education.

Other Educational Institutions:

- Northern Michigan Learning Consortium
 - E-MATHS
- West Shore Community College
 - High school dual-enrolled physics course
 - Articulation of business mathematics class through CTE computer Information systems, office information systems, and accounting classes
 - KeyTrain Tutorial – Share Computer Laboratory Space
- MLISD/OISD Special Education Department
 - Providing Algebra teachers with Texas Instrument technology using ESEA Funds
 - 422 TI-Nspires
 - 4 TI-Navigator Systems
 - 14 CBRs (Motion Detectors)
 - 9 Document Cameras and 5 LCD projectors
 - Co-facilitate high school reform and personal curriculum updates to administrators and counselors
- Manistee ISD
 - MATHCOUNTS
 - Sharing of professional development workshop offerings
- Mason-Lake Career and Technical Education Center
 - Articulation of business mathematics class through three CTE courses
 - KeyTrain tutorial sessions for WorkKeys Mathematics

Business and Industry:

- Dow Midland
 - You Be The Chemist Competition
- Nordlund and Associates, HARSCO Track Technologies, and local engineers
 - MathCounts
- Texas Instruments
 - Donations of items for teachers and/or summer camps
 - Co-created technology plan for our service area
- Local newspapers and radio stations
 - Coverage on MLOMSC sponsored events
 - Free advertising upon request

Community Organizations:

- AFFEW – Speaker at Michigan Green Schools Event
- Sandcastles Children’s Museum - Lending of resources

What was the impact of the MLOMSC?

Impact on Students

- MLOMSC partnered with the Mason-Lake Tech Prep Program to offer KeyTrain (a Mathematics WorkKeys tutorial) to students at the Center. Students used KeyTrain throughout the year. 67% of students in the program reached levels 6 or 7 on KeyTrain. (These are the two highest levels of KeyTrain.) 59% increased one or more levels over the year.
- MLOMSC sponsors a regional “MATHCOUNTS” competition. All students in MATHCOUNTS receive a scholarship to West Shore Community College for a Calculus-level or higher course.
- The WSCC physics collaborative has provided students from any of our area schools the opportunity to take a high-quality physics class on an annual basis. Students would not have the opportunity to take physics at their local school.
- MLOMSC sponsors the You Be The Chemist Regional Competition. The number of schools involved in this program continues to increase each year; this year we had 7 districts involved in this competition.
- This was the first year we honored our local schools for being named Michigan Green Schools. At our regional awards ceremony, students shared what they are doing to lead their district in environmental awareness and protection.
- The mathematics summer camp we offered this year provided each student with a TI-Nspire calculator and provided them with real-world applications for linear functions to support their learning of Algebra.

Impact on Teachers

- During our September Professional Development Day, we provided teachers with reports of their MME data. Basing instructional decisions on data has become part of the teachers’ planning cycle. The spring K-8 math administration through Data Director has given teachers immediate access to data in order to better align their curriculum and meet student needs.
- Our BAP distribution list, mathematics e-mail distribution lists, and MLOMSC website continue to keep teachers informed on the latest updates in mathematics and science education. All of our K-8 mathematics common assessments are now available for teachers to access in Data Director. This allows for greater scheduling flexibility.
- We provide graduate credit opportunities through Madonna University for our mathematics and science professional development.

Impact on Schools

- In collaboration with our special education department, we were able to provide every district in our service area with calculators to support the functions-based approach to Algebra. 422 TI-Nspire calculators are currently on-loan to area schools for use in Algebra courses.
- Our Hands-On Science Kits continue to be the primary source of science instruction for many of our local elementary schools. Without these kits, schools would likely lack the resources necessary for students to be actively engaged in scientific inquiry.
- Our cross-district PLC workshops provide many of our smaller schools the opportunity to work with professionals from other districts. This may be their only opportunity to share ideas with other educators who teach the same discipline or grade level.
- MLOMSC typically is the only source of mathematics and science professional development in our three counties.

Impact on Communities

We continue to value our partnerships with our local engineers, our neighboring ISDs, our local community college, and our area newspapers and radio stations. Over the course of the year, we donated (or loaned) supplies to the Mason County Library, to the early childhood center, and to Sandcastles Children’s Museum to support the mathematics and science education programs that these organizations promote in the community.

Director's 2009-2010 Budget Discussion

Mason-Lake ISD currently pays the salaries for the administrators involved with the Mason-Lake Oceana Mathematics and Science Center (MLOMSC). Furthermore, Mason-Lake ISD provides space for MLOMSC at no additional cost. We appreciate this funding support from Mason-Lake ISD. Mason-Lake ISD and Oceana ISD also provide shared secretarial support to our Center. Furthermore, our close connection with both ISDs has provided us with many opportunities to connect with teachers and administrators. Without the support of Mason-Lake ISD and Oceana ISD, our tiny Mathematics and Science Center would struggle to exist.

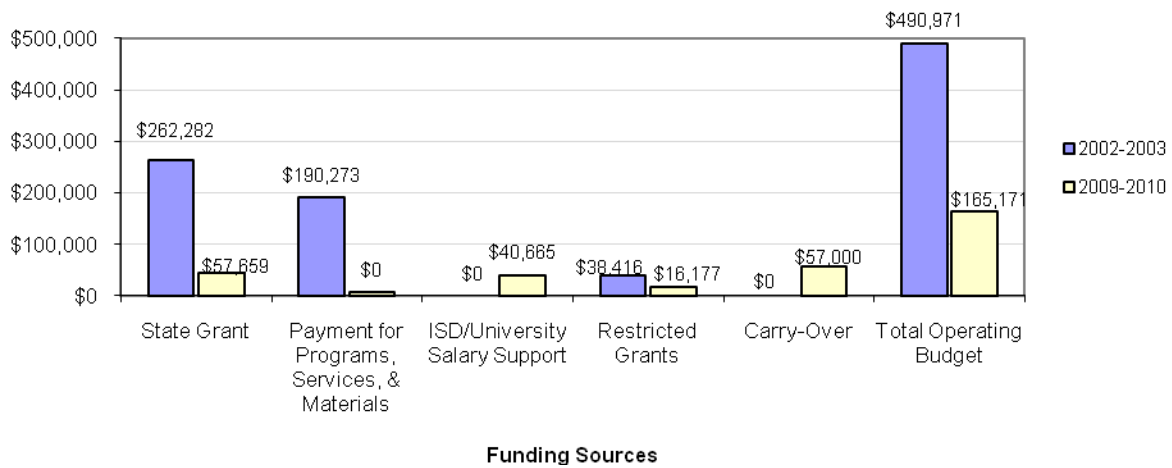
Last year, MMSTLC provided us with teacher leaders capable of assisting us in our mathematics and science initiatives. Without the MMSTLC grant this year, our man power has decreased. This reduction in man power has caused a decrease in the number of professional development opportunities and student services we provide.

Due to the budget cut we encountered this year, we eliminated our science van program. This was an unfortunate loss for our Center. The science van traveled to area elementary schools and promoted various inquiry-based activities for our students. This program inspired many students to gain an even stronger interest in science. We were greatly saddened to lose this unique opportunity.

Of greatest concern is our Hands-On Science Program. The cash reserve being used to fund this project is projected to last approximately 1 year. We have sought funding from private resources. We are having difficulty finding appropriate grants for the Hands-On Science Program since it is not a new initiative. Our local schools have very tight budgets and could have difficulty paying for the Hands-On Science services at the level which would sustain the program when our cash reserve is depleted. With the struggling economy, it is difficult to secure additional funding through the private sector in our area.

We are appreciative of additional revenue, such as 99.6, which assists us in offering high quality professional development for our teachers. These grant opportunities have had a positive impact on our local teachers. The statewide initiatives, such as Algebra for All, have provided our teachers with a coherent professional development series without creating tremendous hours of extra work for our Math/Science Center staff. We look forward to more collaborative grant opportunities through the Michigan Mathematics and Science Centers Network.

Changes in Mason-Lake Oceana Mathematics and Science Center's Financial Support



Director's Summary 2009-2010

It is apparent how important MLOMSC's work is to mathematics and science education in our area. Many of our schools do not have a curriculum director or an administrator with a background in mathematics or science education. Some of our schools have only one mathematics or science teacher at the secondary level. We are typically the sole source of mathematics and science professional development in our area. We have solid working relationships with our local administrators and they trust us to provide services they are unable to provide themselves. We furnish elementary teachers with the necessary resources for science instruction. On average, our elementary teachers schedule three hours of science instruction each week. Without our Hands-On Science resources, these three hours would likely decrease and be very textbook driven. We offer student services, such as: the MATHCOUNTS Competition, the You Be The Chemist Competition, and the summer mathematics camp. These activities make mathematics and science more fun and enrich the instruction students are receiving in the classroom. We are dedicated to continually improving our annual programs as well as adding new services based on local need.

During 2009–2010, we intentionally had more multi-day professional development workshops. Furthermore, we worked on promoting “big ideas” in mathematics and science education; such as the functions-based approach to teaching Algebra and inquiry as a means of teaching science. We continue to keep technology as a thread in our offerings.

We proudly continue to be a resource clearinghouse for our districts. We provide our K-8 mathematics common assessments online. Our Hands-On Science Kits come with all the necessary materials and handouts for teachers. We have various pieces of technology on-loan to our constituent districts.

Our teachers are dedicated life-long professionals. In the summer, teachers have mapped their curriculum, attended content-related professional development, ran summer camps, and much more. Our Mathematics and Science Center is staffed year-round to assist teachers and administrators whenever they are in need.

At the elementary level, the focus of our work has revolved around curriculum development and corresponding professional development. We have revamped our entire Hands-On Science program to meet the GLCEs and we've provided professional development to keep the teachers current with how to use the kits. With the impact of Algebra I failures at the secondary level, we have worked with elementary educators on mapping their mathematics curriculum. We have spent a tremendous amount of time preparing and delivering our K-8 mathematics initiative, Methods for Reaching Mastery in Mathematics (M³). We have revamped our data system for our mathematics common assessments at the K-8 level to be more user-friendly for our teachers. We've been working on RtI models at the elementary level in mathematics.

It has been a busy year at MLOMSC. We have concerns that our budget will not continue to support all our programs in the future. We look forward to developing more teacher leaders and/or retired teachers to assist us with our efforts. We also look forward to more collaborative efforts to provide high-quality opportunities for our teachers while concurrently reducing our individual workload.