



# Mecosta-Osceola Math/Science/Technology Center 2015-2016 Annual Report

The Mecosta-Osceola Math/Science/Technology Center (MSTC) serves Mecosta and Osceola Counties located in the west central portion of the lower peninsula of Michigan. The mission of the Center is to help schools help students by collaborating to maximize achievement in mathematics, science, and technology.

## Overview of the Year's Accomplishments

### Regional Science Fair and Family Engineering Night

The Math/Science/Technology Center, in partnership with Ferris State University College of Engineering Technology and the Mecosta-Osceola Career Center, hosted the annual Regional Science Fair for middle school students in the two counties. Students from Reed City Middle School, Chippewa Hills Middle School, Crossroads Charter Academy, and Big Rapids Elementary Schools competed against each other. After three hours of deliberation from the volunteer judges provided by Ferris State University (FSU), five students received trophies and awards based on certain criteria. Students also had the opportunity to defend their science project and participate in a competition where the winner is determined by the public. Students were found discussing and arguing scientific topics without the guidance of an adult.

The Family Engineering Night coincided with the Regional Science Fair to provide students with the opportunity to learn what it means to be an Engineer. Over 100 students and parents attended the event and feedback was extremely positive. Many parents were grateful that the event took place so they can help educate their child on opportunities in the STEM fields.

**Over 100 students and parents attended the Family Engineering Night/Regional Science Fair and feedback was extremely positive.**

Many of our community partners shared in the planning and success of this event. Volunteers included: Dr. David Frank (FSU), Laura Forbes (FSU) and MOCC staff and students, several LEAs, and FSU College of Engineering and Technology.

### Robotics & Coding Clubs

The Mecosta-Osceola MSTC and ISD received \$9,587 to develop Robotics & Coding Clubs at the Elementary and Middle Schools in Mecosta and Osceola counties. Each of the districts received training on Google CS-First, start-up funds for the club, and Dash & Dot robots for materials. Four out of the six districts started coding clubs for middle school students. Two districts will be starting their coding clubs in the fall of 2016. There were over 100 students that participated within the clubs ranging from 1st grade to 8th grade. Three of the clubs met afterschool but one club incorporated the robots and coding within their curriculum.

**Over 100 students in 1<sup>st</sup> – 8<sup>th</sup> grade participated in the Robotics and Coding Clubs.**



Figure 1- Students are using Dash & Dot robots to learn computer programming.

On February 27th, the MSTC partnered with Ferris State University College of Engineering Technology and HVACR program to put on a student competition for the coding clubs in the region. Approximately 50 students participated in the regional competition. Students competed in various challenges that tested their coding skills, collaboration and critical thinking. They worked together collaboratively and

accomplished tasks that shocked their own coaches. The college provided 25 student volunteers from the Women in Technology and Mechanical Service Contractors of America groups. While the winners of the competition were being determined, the student volunteers shared various career opportunities in STEM related fields.



*Figure 2- Fifth grade students compete at the Regional Robotics & Coding event.*

Since the inception of the coding clubs, coaches have been raising their own funds to purchase additional materials, districts have agreed to provide coaches stipends, and two districts put on their own competitions. Next year, the coaches agreed to work together to provide various competitions to prepare the students for the regional competition hosted at Ferris State University.

### **Science Round Table Discussions**

The MSTC, with collaboration with the General Ed Department, hosted science round tables for K-12 science educators in response to the adoption of the Michigan Science Standards. Approximately 40 teachers came together to discuss the various changes and the expectations of what is to come with the new standards. Teachers participated in professional learning activities that compared science instruction that was acceptable in the past and how science instruction should look after implementation. Science round tables will continue in the 2016-17 to support the local districts with the implementation of the Michigan science standards.

### **Super STEM Saturdays**

In partnership with Ferris State University College of Arts & Sciences and College of Engineering Technology, 30 middle school

students participated in STEM related workshops. In the spring, the students spent two hours of their Saturdays to learn about various STEM topics that would not be available to them in their own local schools. These workshops were led by Ferris State professors at no charge to the students.



*Figure 3- Students test their fan blades and determine how much voltage they can produce.*

Students that participated in the event designed, created and tested blades on a windmill to show them the engineering process. The students swabbed various surfaces for bacteria and after a week were able to see how much bacteria was on that surface. Students used mathematical problem solving to determine the best strategy for a particular game. These were just a few of the activities that the students were able to participate in. The community has shown great support for this program and MSTC will be hosting two more sessions in the 2016-17 school year.

### **Project WET**

This year, the fourteenth annual Make a Splash Water Festival was held at North End Riverside Park in Big Rapids, MI from 9:15 A.M. until 2:00 P.M. on Wednesday, May 28th. This year's festival showcased the Earth Science benchmarks related to water and was attended by over 270 area third grade students from Crossroads Charter Academy in Big Rapids, Morley Stanwood Elementary, and both Brookside and Riverview Elementary in Big Rapids. Festival activities included: The Incredible Journey, Groundwater and Bubbling Rocks experience, Enviroscene, Spring Waters, Springing into Action, Sum of the Parts, and Recycling in Muskegon River Watershed.

Partners for the event include the Grand Valley State University Annis Water Resources Institute (AWRI), Nestle Waters, Muskegon River Watershed Assembly, the Mecosta Osceola Intermediate School District, and Ferris State

University. Students from Big Rapids High School, Crossroads Charter Academy, Morley Stanwood High School, and Ferris State University provided instruction as well. All of these members partnered together and shared resources to promote water education for our third graders.

This event is part of Project WET, an international water science and education

program for educators of students in grades K-12 that is sponsored by contributions from diverse public and private organizations and state sponsors. Project WET is a program, a curriculum, and an instruction and delivery network of Project WET Coordinators and water educators. AWRI serves as the Michigan coordinator for Project WET.

## Organization of the Report

The Strategic Plan identifies six service areas: Leadership, Professional Learning, Student Services, Curriculum Support, Community Involvement, and Resource Clearinghouse. This report will focus on Professional Learning and Student Services for the entire service area. In addition, there will be a narrative on closing the achievement gap describing services to Priority and Focus School(s) in the area, including successes and challenges.

### REGION-WIDE PROFESSIONAL LEARNING

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

#### Who participated in the professional learning?

Professional learning 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 Learning**

Participants			Reported Gender		Position					
			M	F	Admin	Math Tchr	Sci Tchr	Tech Tchr	Comb Subj	Other or Unknown*
Pre-School	1	6	0	1	0	0	0	0	1	0
Elementary	76	436	11	65	1	0	0	0	74	1
Middle/Jr. High	16	95	6	10	1	4	4	0	1	6
High School	32	225.5	11	21	2	3	11	1	2	13
K-12 Mixed Levels	2	18	1	1	0	1	0	0	1	0
Other*	12	67	4	8	0	2	0	0	4	6
Total	139	847.5	33	106	4	10	15	1	83	26

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

Professional learning 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.

**Teachers who participated in Mecosta-Osceola M/S/T Center activities received, on average, 6.1 hours of professional learning related to mathematics, science, or technology.**

Table 2 below details the number of sessions offered for each subject by grade level as well as total hours and total number of participants in the sessions.

**Table 2: Professional Learning Activities**

		<b>Math</b>	<b>Science</b>	<b>Technology</b>	<b>Total</b>
<b>Elementary</b>	Activities	3	3	1	7
	Hours	9.5	10	6	25.5
	# Participants	62	74	18	154
<b>Middle/Jr. High &amp; High School</b>	Activities	0	0	2	2
	Hours	0	0	6	6
	# Participants	0	0	26	26
<b>Middle/Jr. High &amp; High School</b>	Activities	0	1	0	1
	Hours	0	6	0	6
	# Participants	0	17	0	17
<b>High School</b>	Activities	0	0	3	3
	Hours	0	0	16	16
	# Participants	0	0	34	34
<b>Total</b>	Activities	3	4	6	13
	Hours	9.5	16	28	53.5
	# Participants	62	91	78	231

## *Spotlight on Professional Learning*

Mecosta-Osceola MSTC Collaborates with Manistee, Wexford-Missaukee Regional Mathematics and Science Center to provide professional develop for all K-12 teachers. This collaboration brought cohesive and in-depth training to multiple educators in the five county region.

### **SCIENCE ROUND TABLES**

With the new Michigan Science Standards being adopted, the MSTC is working with the local districts to help implement the new standards. After discussions with the curriculum directors and principals, the MSTC hosted science round tables. The goal of the round tables was to give the instructors time to discuss and process the new standards. The MSTC provided professional learning activities that the teachers can use as discussion points. Teachers overviewed two different instructional sequences with one that met the expectations of the old standards and one that met the expectations of the new standards. They also looked to see how each of the instruction sequences met the three dimensions of the Next Generation Science Standards.

**The MSTC hosted science round tables to help implement the new Michigan Science Standards.**

The MSTC set a goal of having representation from every building within the region and met that goal with all six districts participating. Approximately 45 instructors attended and opened up more conversations within their own local districts. The MSTC successfully became the catalyst for implementation of the new standards for the local districts.

### **GOOGLE TRAINING**

In the 2015-16 school year, all the local school districts adopted Google Apps for Education. All the districts are requiring the teachers to use the apps and some have students using the apps as well. The MSTC supported the districts by providing professional learning on how to use Google Drive, Docs, Sheets, Forms, and Slides both in the classroom and professionally. Three school districts hosted Google trainings and over 80 teachers received Google training outside of school hours. More trainings are planned for the 2016-17 school year.

## Student Services

Student services are delivered based on identified needs to improve and enhance science, technology, engineering, and mathematics 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:

- ❖ science and mathematics fairs and academic competitions
- ❖ family events designed to increase awareness of STEM fields

Table 3 below details the number of student sessions offered for each subject by grade level as well as total hours and total number of participants in the sessions.

**Table 3: Student Services Activities Provided in 2015-2016**

		Science	Technology	Other	Total
<b>Elementary</b>	Activities	1	0	1	2
	Hours	3	0	3	6
	# Participants	270	0	90	360
<b>Elementary &amp; Middle/Jr. High</b>	Activities	0	1	1	2
	Hours	0	5	3	8
	# Participants	0	49	75	124
<b>Middle/Jr. High</b>	Activities	0	0	1	1
	Hours	0	0	10	10
	# Participants	0	0	32	32
<b>Total</b>	Activities	1	1	3	5
	Hours	3	5	16	24
	# Participants	270	49	197	516

## Spotlight on Innovative Student Services

### ROBOTICS AND CODING

The MSTC received a STEM grant from the Michigan STEM Partnership to create Robotics & Coding clubs and host a regional competition for the teams. In the Fall, instructors and volunteers came together to become trained on Google CS-FIRST and how to implement it back to the classroom and in extra-curricular activities. Most of the districts started their clubs immediately by meeting afterschool 1-2 times a week. One district decided to incorporate it in their 7th grade curriculum. Each district also received Dash and Dot robots so the students can apply their skills that they learned from Google CS-FIRST.



*Figure 4- Students from Chippewa Hills Public Schools participated in the Regional Robotics & Coding Competition.*

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Service Contractors of America groups. While the winners of the competition were being determined, the student volunteers shared

various career opportunities in STEM related fields.

Since the inception of the coding clubs, coaches have been raising their own funds to purchase additional materials, districts have agreed to provide coaches stipends, and two districts put on their own competitions. Next year, the coaches agreed to work together to provide various competitions to prepare the students for the regional competition hosted at Ferris State University.

**Coaches have been raising their own funds to purchase materials.**



*Figure 5- Robotics and Coding are becoming quite popular among students and schools. Educators are now reaching out for grants and funds to support their clubs.*

## *Closing the Achievement Gap*

In the two counties, there are two school buildings in two separate districts that are reported as a focus school. Currently, there are no priority schools within the counties but a few are on the brink of reaching priority status. With a limiting budget, the MSTC is able to provide some direct custom professional development for those districts but the majority of professional learning is offered to all districts. Instructors in these focus schools have benefited from those professional learning events by being able to collaborate with neighboring districts.

**The MSTC is the epicenter and communicator for all math and science information for the two counties.**

The MSTC is also involved with the ISD-wide curriculum meetings, principal meetings, and instructional support staff meetings. District staff are informed of state level changes, standard changes, comparative achievement data, and professional learning events. The MSTC is the epicenter and the communicator for all math and science information for the two counties.

## *Spotlight on Partnerships*

The MSTC strengthened their partnerships with local business, industry, and educational institutions in the past year. Ferris State University has been an integral part in bringing more opportunities to the local school districts. FSU's College of Engineering and Technology, along with the HVACR program, have sponsored events by providing food, space, and volunteers for various events. Ice Mountain has been involved with MSTC as well by providing a grant to run the annual Project WET event for 3<sup>rd</sup> grade students and providing food for the STEM Symposium at FSU.

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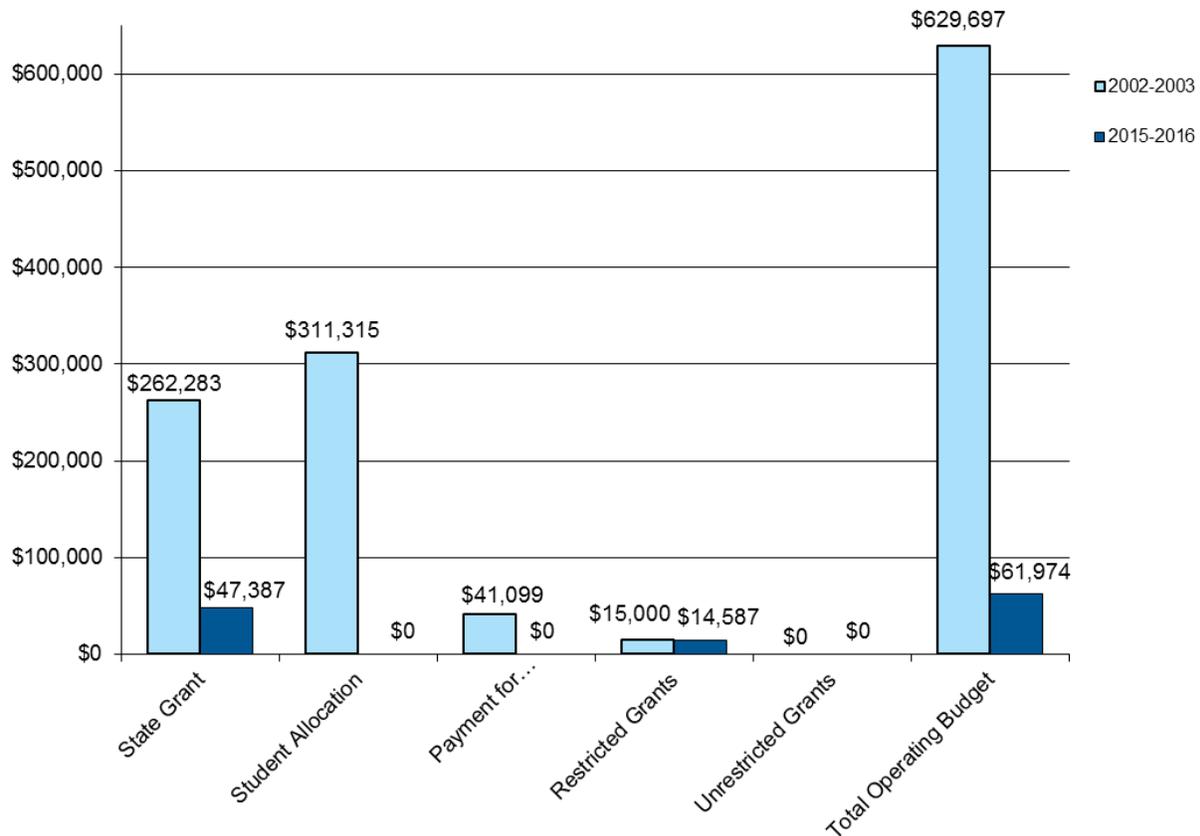
In the 2015-16 school year, the MSTC strengthen another partnership with the Ferris State University College of Arts and Sciences. The MSTC and the College rebirthed STEM workshops at the university this past year with great success. The workshops were thoroughly enjoyed by the parents and students involved. The MSTC plans to continue the workshops for Fall 2016 and Spring 2017.

## Director's 2015-2016 Budget Discussion

With limited budget, professional learning was kept at a minimal. During the 2015-16 year, there was one MSTC staff. Without staff, the MSTC was unable to complete the districts need for professional learning. To make it more meaningful for the funding that we have received, professional learning was held at the school districts. The instructors received assistance in their own classroom and in their building. The majority of the focus was supporting districts in their adoption of new curriculum.

In order to meet the demand of the local districts and continue to have community projects, the MSTC has been looking and writing for other grants. The impact of the MSTC has diminished over the years, but is doing as much as they can with the amount of funding received.

### Change in Mecosta-Osceola M/S/T Center's Financial Support



### Funding Sources

In addition to the financial support illustrated in the graph above, “in-kind” services received by the Center (donated time, facilities, or equipment) were valued at \$4,180.

## Director's Summary 2015-2016

This past year, the MSTC focused their efforts on local professional development to meet the needs of the local educational agencies. With limited staff, the MSTC has been innovative and strategic in the services that are provided. Some opportunities are still available because of partnerships but other opportunities had to be outsourced. The center has been working at the state-level to help provide professional learning to the local districts. Without the Network and other state-wide groups, the MSTC would not be able to provide quality professional learning.

In years past, teacher participation at professional learning event hosted by the ISD have been low. The MSTC has been providing custom professional develop directly in the school buildings with teams of teachers. This has been more powerful to the teachers and district because of the relevancy to their situation. Evert Elementary and GT Norman Elementary both adopted new curriculums in the past year and the MSTC has been supportive in the transition. Each of the districts started using Google Apps for Education and the MSTC provided custom training at the districts to support their growth.

The MSTC had two major initiatives with student services in the 2015-16 school year. Partnering with the College of Arts and Sciences at Ferris State University, the MSTC help to put on STEM workshops for students at no cost. The students were able to learn about topics from the professors that they would not normally receive from the local schools. Through a STEM grant from the Michigan STEM Partnership, the MSTC was able to support the local districts in creating Robotic and Coding clubs for middle schools. Four out of the six districts participated and all the districts' plan to have a club for the 2016-17 school year.

The MSTC has been successful in informing the local districts and community of their purpose and duties since the accelerated program dissipated. This has been a battle for the new Director but most stakeholders now understand the MSTC.

This report was developed through a grant awarded by the Michigan Department of Education.