

Request for Proposals

To Improve Middle School Math in the Great Lakes Bay Region

Submitted by STEM Networks

Facilitated by Saginaw Valley State University

and Central Michigan University

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Table of Contents

Introduction..... 3

Background..... 3

Assumptions..... 4

Math Task Force 4

Program Recommendations 4

Framework for Proposal Development..... 5

RFP Process and Timeline 7

Timeline 7

Budget..... 7

Appendix A: Math Task Force Members 8

Appendix B: Option A & B--Math Recommendations 9

Appendix C: Option C - Creative Math Programs..... 13

Appendix D: Evaluation Plan - IEval 16

Appendix E: Request for Proposals to Improve Middle School Math 17

Introduction

The STEM Networks facilitated by Saginaw Valley State University (SVSU) and Central Michigan University (CMU) proposes the funding of sites in the Great Lakes Bay Regional Alliance Region (Arenac, Bay, Clare, Gladwin, Gratiot, Isabella, Midland, and Saginaw counties) to improve middle school math. The project will be for one year at a total budget to be determined by the number and cost of individual proposals funded for the first year. Additional sites will be added on during two option years based upon evidence of results during the first year.

The Networks have identified two nationally-recognized, evidence-based middle school math programs and two nationally-recognized teacher development programs to be funded. A third option for funding is creative programs (in-school, out of school or a combination of in partnership with non-school entities) which have proven results for increasing middle school math achievement.

An RFP process will invite schools to propose projects that will be vetted by the SVSU and CSU Networks, the STEM Process Review Committee and the Steering Committee before being presented to funders for approval. A specific evaluation strategy will be included for each site, including both quantitative and qualitative data in order to identify which programs are successful. A start date of July 1, 2016 is proposed based upon funding availability.

Background

Under the GLBRA STEM Initiative project, the STEM networks facilitated by Saginaw Valley State University (SVSU) and Central Michigan University (CMU) began meeting in April, 2015. They were assigned two sets of recommendations from the research report entitled “Building a Robust STEM Talent Pipeline in the Great Lakes Bay Region”:

- Career and College Ready Students
- Sustained by a Culture of STEM

Their first order of business was to identify which of the various recommendations under these two areas to pursue during the “launch” phase of the project. Both Networks decided to focus on the same recommendation of improving middle school math, given its critical role in moving students to STEM careers. The specific goal is to develop a process to be used regionally to improve math proficiency. The STEM Report defined middle school math as Grades 5-8, although the networks quickly learned that this definition varies by school districts within the region.

Because many members were not familiar with middle school math programs and approaches, the networks began with a review of those recommended by the research report as well as by regional entities. Discussions in both networks during the initial meetings helped the members better understand the challenges of improving middle school math. As a result, they identified an initial set of criteria for evaluating various programs.

Assumptions

Based upon the discussions of the two STEM networks, a set of assumptions was derived that formed the basis for developing a specific proposal to address the middle school math achievement issue. These assumptions include:

- Innovative approaches are available and should be considered for any solution
- Any number of solutions are already being considered and/or implemented in the region, including Intel Math, Math Camps, Singapore Math, Digits, STEM Fridays, professional development for teachers, Steppingstone, and so on.
- The realities of the K-12 education system, including opportunities and constraints, need to be respected and taken into account in any proposed solution; they are a key component of the STEM Talent Pipeline
- The success of any one approach to instruction is dependent on the quality of its implementation, so professional development for teachers and other implementers must be part of the solution
- There is a recognition that measures of success need to be part of any solution, but some are more long-term measures, e.g. state achievement tests
- Middle school math cannot be viewed in isolation from what is occurring in the earlier grades
- A major consideration should be the alignment of any curriculum to current state standards
- Any approach should be able to be replicated/duplicated in similar settings within the region, e.g. small versus large districts, urban versus rural, low versus high socioeconomic status
- Proposals for non-school based entities should be encouraged

Math Task Force

The two STEM networks then decided to form a smaller Math Task Force which would meet for a lengthy brainstorming session to develop a regional approach to improving middle school math. The proposal developed will be vetted by the full membership of both STEM Networks, revised, and then presented to the STEM Process Review Committee. Members from both networks volunteered for the task force at the request of the two network facilitators. Group members were comprised of multiple sectors from across the region, including K-12 education, business, higher education, and community organizations. (See Appendix A for a full roster of those in attendance).

The Math Task Force met three times during the summer of 2015. The key charge of the group was to create a framework for developing a formal grant proposal for funding initiatives that address middle school math. In general, members of the task force indicated that the sessions went a long way to achieving this goal.

Program Recommendations

The networks were then charged with recommending specific math program in three areas:

1. Two math programs/curriculum
2. Two professional development programs
3. A suggested list of “creative” programs but not exclusive of other approaches

Recommendations were then identified through the following process:

1. Network leaders and program staff reviewed a number of sources of information to identify those math programs which had evidence-based research to back up the claim of improving middle school math. These sources included:
 - a) Recommendations from the research phase of the GLBRA STEM Initiative Network member reviews of various math programs as indicated above;
 - b) STEMWorks, a database of programs vetted by McRel (Mid-Continent Research For Education and Learning) and endorsed by Change the Equation
 - c) A review by IEval, a Michigan research firm that specializes in evaluation services
2. Eight programs were then identified that had the strongest evidence of effectiveness—four in the math program/curricular area and four in the professional development area.
3. Networks met to discuss the eight programs and then were surveyed to rank order them. Eighteen members participated in the survey.
4. The Math Task Force met on November 2, 2015, to discuss the survey results and make final recommendations for the proposal. A formal vote was taken and the task force unanimously chose the top two choices from the survey results for both the math programs/curriculum and professional development programs.
5. Finally, “creative” programs which showed promising results were identified as optional choices.

Framework for Proposal Development

The Math Task Force provided the following parameters to be used in developing a proposal to address middle school math in the GLBRA region:

1. For the Initial Year I Phase, any school can apply for funding on a self-selection basis. This can include individual classrooms, teachers, schools, and districts. The target population may vary from 5th to 8th grades, based on the specific definition used by the school district. Proposals will be selected for funding during the 2016-17 school year based on established criteria and strength of proposal.
2. There are three ways in which a school or school district may request/receive grant dollars from a funding source supporting the STEM Impact Initiative:

Option A:

The STEM Networks recommend two nationally-recognized, evidence-based middle school math programs for the schools to choose from – the school decides to implement one of the recommendations. These Programs are:

- A. ST Math (Mind Research Institute)
- B. I Can Learn Education System

Option B:

The STEM Networks recommend two nationally-recognized teacher development program shown to improve middle school math achievement – the school chooses to implement the program. These programs are:

- A. Virginia Mathematics Specialist Program
- B. Professional Learning Community

Descriptions of each of these programs can be found in Appendix B.

Option C:

The school or school district submits a grant request to the STEM Network for a creative program (in-school, out of school or a combination of) that has proven results for increasing middle school math achievement – this is subject for review by the Process Review Committee and STEM Steering Team. These proposals can be in partnership with businesses, youth programs, internet-based programs, community-based organizations, public libraries, and parent programs. This list provides examples, but is not meant to be inclusive or exclusive. The site(s) and site partner(s) definition is open and all are welcome, but the partnering needs to make sense with the end result of raising middle school math achievement.

Note: Entities may submit a proposal outside of the three categories, which may limit the probability of funding. Also, the Process Review Committee may advise a submitter on how to improve proposal if deemed warranted and a school may re-submit their proposal for further consideration.

For Option C innovation and a variety of approaches to improving middle school math will be encouraged. A list of those approaches recommended in the research phase of the study, the STEMWorks database for Change the Equation, and other approaches identified during the past few months can be found in Appendix C. This list is not exclusive of other approaches that a submitter may wish to propose. Such approaches could include math coaches, professional development, professional learning communities, on-line programs, hybrid programs, tutoring, after-school programs, math camps, STEM field experiences for teachers, family outreach, and any combination of these approaches. No one approach will automatically be precluded from consideration.

3. All proposed approaches, including existing programs and approaches, must include a rationale and/or any evidence that they are achieving an increase in math achievement among middle school students, i.e. a growth model. Funding cannot be used to supplant existing programs.
4. All sites must agree to provide data supporting evidence of success, including the usage of pre-test and post-tests to demonstrate gains in math achievement/scores. An independent evaluator for all pilot sites will be hired before the pilots begin to develop a specific evaluation plan which would include the selection of tests and the collection and analysis of data across all sites. Tentative discussions have begun with IEval, an education evaluation research firm which does work nationally. IEval was contracted to conduct an independent review of math programs for this proposal. Appendix D provides an outline of their suggested evaluation approach for this project.
5. The timeframe for implementation is as follows, dependent on the availability of funding:
 - Year 1: July 1, 2016 to June 30, 2017
 - Year 2: July 1, 2017 to June 30, 2018
 - Year 3: July 1, 2018 to June 30, 2019

6. Funding is needed for implementation of the sites. The funding of sites must take into account approaches which could include the hiring of additional personnel (e.g. career coaches, substitute teachers), teacher training, licensing of software, purchase of hardware, and so on. Further discussions of funding amounts needs to be held before a final funding level is determined for inclusion in the proposal.

RFP Process and Timeline

The above framework was vetted by both STEM networks and the Process Review Committee of the STEM Steering Committee. As a result, an RFP was prepared to send to all entities interested in submitting a proposal for funding. The RFP can be found in Appendix E. Once funding is secured for the project, the RFP will be issued.

Timeline

First Year 2016-2017

March 4	Release of RFP
March 9 & March 16	Webinars scheduled from 4:00-5:00pm
March 18	Intent to Apply is not binding but helpful to potential funders & reviewers https://www.surveymonkey.com/r/STEMMiddleSchoolMath
April 22 by 4:30pm	Proposals Due online at http://svsu.infoready4.com
Week of April 25	Access given to reviewers Hiring of Fiscal/Administrative Agent and Independent Evaluator
May 17	Year 1 sites notified of awards
July 1, 2016	Year 1 sites begin implementation
July 30, 2017	Annual Project Report Due from Year 1 sites

Second Year 2017-2018

March 3	Proposals due for Year II funding
April 3	Year II sites notified of awards
July 1, 2017	Year II sites begin implementation
July 30, 2018	Annual Project Report Due from Year II sites

Third Year 2018-2019

March 3	Proposals due for Year III funding
April 3	Year III sites notified of awards
July 1, 2018	Year III sites begin implementation
July 30, 2019	Annual Project Report Due from Year III sites

Budget

The budget will be based upon the number and cost of individual proposals funded for the first year. In year 1 projects will be funded to represent geographic regions throughout the region and based upon funding availability. Additional sites will be added during year 2 and 3 based on evidence of results during year 1. Funding for a fiscal/administrative agent and independent evaluator will be based upon 8% and 5% of the total funding respectively.

Appendix A: Math Task Force Members

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Appendix B: Option A & B--Math Recommendations

Option A: Math Programs

ST Math (Mind Research Institute)

Website: <http://www.mindresearch.net/>

Description: ST Math is a game-based instructional software to support math curriculum. Middle school supplement prepares students for success in Algebra 1 by remediating students on concepts from previous grade levels and by building students' conceptual understanding of select on-grade-level math concepts from 6th, 7th and 8th grade mathematics. The built-in diagnostic tool personalizes the learning path for students and gives each student the intervention content that he or she needs.

Evaluation Information: *STEMWorks: Accomplished & Ready to Scale (Change the Equation); A WestEd study found that those grades using the program for one year exhibited 6.3% more students scoring proficient or better on the California Standards Test, compared to those at similar schools not using the program.

Estimated Costs: \$24-\$29 per student annually. **Contact person for STMath:** Jon Weiss, M.Ed., Education Partnerships Manager (Ohio – Michigan), **MIND Research Institute**, Mobile: [440.731.0288](tel:440.731.0288), jweiss@mindresearch.org Jon is available for phone calls, webinar presentations, on-site meetings, and setting up demo accounts.

I CAN Learn® Education System

Website: <http://www.icanlearn.com/>

Description: The I CAN Learn® Education System is an interactive, self-paced, mastery-based software system that includes the I CAN Learn® Fundamentals of Math (5th–6th grade math) curriculum, I CAN Learn® Pre-Algebra curriculum, and I CAN Learn® Algebra curriculum. Teachers can manage their classrooms through the I CAN Learn® Classroom Explorer Class Management System, which keeps track of student attendance, homework, and test grades. It can also help in developing individual learning plans to meet diverse student needs. A one-to-one student-to-computer ratio and one-on-one interaction with the classroom teacher lets each student progress at his or her own pace.

Evaluation Information:**WWC: Strong evidence this intervention had a positive impact on student achievement (++); Medium to large evidence rating Student improvement index rating = +5

Estimated Costs: \$53.48/student/year \$15-30,000 per site 50% discount if a school agrees to participate in a research study. **Contact person for I Can Learn** - Juliana Mims, Executive Director, I CAN Learn® Education Systems. Direct Line: [323-377-6103](tel:323-377-6103), jmims@icanlearn.com Juliana is available for phone calls, webinar presentations, demos, setting up demo accounts, and possible on-site meetings.

Option B: Professional Development Programs

The Virginia Mathematics Specialist Program

Website: <http://pi.math.virginia.edu/teach/specialist.htm>

Description: The Virginia Mathematics Specialist Initiative (VMSI) prepares K-8 teachers to be full-time mathematics specialists who help other teachers become more effective by supporting them with daily professional development. Independent evaluation confirms that VMSI significantly improves student performance in mathematics. The VMSI 39-hour, master's degree, teacher training program has four key components: 1) five core courses covering K-8 mathematics content; 2) three mathematics education leadership courses that help specialists develop the skills necessary to work with all members of the educational team; 3) elective courses that target specific areas of need for mathematics specialists including advanced middle school mathematics content and working with diverse populations of students; and 4) a year-long, in-school, externship in which participants have the opportunity to practice the skills developed throughout the program. Participants deepen their understanding of mathematics, how to teach it, how to support their peers, and how to ensure that teachers tailor their instruction to diverse students' needs. VMSI courses are all collaborative and project based.

The overarching purpose of the mathematics specialists is to increase the mathematics achievement of all students in their schools. To do so, they:

- Collaborate with individual teachers, teams of grade level mathematics teachers, and with vertical teams across grade levels through co-planning, co-teaching, and coaching
- Assist administrative and instructional staff in interpreting data (both formative and summative) and designing approaches to improve student achievement and instruction
- Collaborate with teachers and teams of teachers to ensure that the school's instructional practices are aligned with state and national standards, as well as their school division's mathematics curriculum
- Assist teachers' with delivery and understanding of the school curriculum through collaborative long-range and short-range planning
- Facilitate teachers' use of successful, research-based instructional strategies, including differentiated instruction for diverse learners, and appropriate use of technology
- Provide job-embedded professional development focused on both mathematical content knowledge and mathematical pedagogy
- Assist teachers in fostering partnerships with parents/guardians and community leaders to foster continuing home/school/community relationships focused on students' learning of mathematics
- Collaborate with administrators (both in and outside of the mathematics community) to develop a vision and to provide leadership through professional development and for a school-wide mathematics program

Research: *STEMWorks: Accomplished

Virginia Math and Science Coalition: A study involved over 24,500 student test scores drawn from Grades 3, 4, and 5 in 36 schools across 5 Virginia school divisions over a 3-year period. Analyses revealed that over time Mathematics Specialists have a statistically significant positive influence on student achievement in all three grades. Compared to control schools:

- The increase in scores for third-grade students in schools with a trained Mathematics Specialist was on average of nearly 10 points higher on Virginia's Standards of Learning mathematics tests during the specialist's second year, and over 16 points higher during the specialist's third year.
- The increase in scores for fourth-grade students in schools with a trained Mathematics Specialist averaged a statistically significant 15 points higher on Virginia's Standards of Learning mathematics tests during the specialist's second year, and over 13 points higher during the specialist's third year.
- The increase in scores for fifth-grade students in schools with a trained Mathematics Specialist was also statistically significant, an average of over 19 points higher on Virginia's Standards of Learning mathematics tests during the specialist's second year and over 20 points higher during the specialist's third year.
- Policy leaders and principals in research school divisions had unanimous confidence in the in-school coaching model, and all were eager to implement it in all elementary and middle schools.

Estimated Costs: Any proposal would include a partnership with CMU and/or SVSU: Central Michigan University and Saginaw Valley State University will offer based on level of interest for Numeracy Professional Development Series of up to 27 credits following the Virginia Mathematics Specialist Program to meet the needs and requirements in Michigan. Participants will be awarded SCECH's and a stipend award. The opportunity for teachers will begin in Fall 2016. Continuing funding for this program in year 2 will be based on project success.

Professional Learning Community (PLC)

Website: <http://www.allthingsplc.info/about>

Description: A PLC is an ongoing process in which educators work collaboratively in recurring cycles of collective inquiry and action research to achieve better results for the students they serve. Professional learning communities operate under the assumption that the key to improved learning for students is continuous job-embedded learning for educators. PLCs provide the opportunity to deepen teacher knowledge through the lived experiences of teachers and critical reflection. There are five key components: 1) A focus on learning; 2) collaborative teams; 3) collective inquire; 4) action orientation; 5) continuous improvement; and 6) results orientation.

Evaluation Information: Eight studies indicated positive impact on student academic achievement, and several studies show that only PLCs that focused on instructional practices and how they impact student learning actually impacted student learning. Studies including quantitative and qualitative data analyses found changes in teacher practice (11 studies - 5 with specifically attributed changes) including more student-centered, flexible classroom arrangements, changes in the pace of instruction, strategic focus, higher levels of social support, and authentic pedagogy.

Math results from West Middle School in Portage, MI ([www.allthingsplc.info/evidence/details/id, 506](http://www.allthingsplc.info/evidence/details/id,506))

The math department has identified new "Power Standards" (i.e. the food, water and shelter for math that without, the students would not survive). On Sept. 5, 2014 each of these was assessed with the following proficiency being met: 48%, 22%, 74%, 48%, 29%, 59%. At the half-way point of the year the 3rd assessment on these same six standards was given and the following proficiency was noted: 92%, 75%, 75%, 83%, 79%, 91%. As you can see, there as has been a drastic improvement.

Estimated Costs: From West Middle School in Portage, MI: The PLC idea is a model, not a canned program and as such there is not necessarily a standard "cost" to implement. Costs do depend on where the school is in terms of their culture, schedule, staffing, etc. For example, does the school have a scheduled time during the school day to offer students extra time and support? If yes, then no cost, if not, what would it take to do so: contract negotiations, programming, staffing, etc.

Example costs identified by the Math Task Force include:

Conference fees (including travel) - \$669 per teacher for 3 days (add in travel and meals during travel – maybe \$900 or \$1000 per participant) to learn about PLCs and how to develop one at a new location

Consultant fees (ISD) - \$500/month (\$250 per visit) to facilitate on-going meetings for teachers

Book fees - \$15 per book/participant

Stipends for teachers (include meals) - \$200 per teacher per month (2 meetings per month, each one at \$100) and \$100 meal stipend per month to allow for on-going meetings of teachers after attending the conference

Appendix C: Option C - Creative Math Programs

Program Name	Description
Blueprint Fellows	Fellows provide daily, small group tutoring sessions to students, working full-time and leading 5-6 carefully planned sessions to 2-4 students per period throughout the school day. Fellows work to accelerate each student’s academic achievement as well as meet the individual learning needs of each of their students. Small group tutoring used during the school day. The Denver Public Schools Office of Accountability, Research, and Evaluation has also conducted an independent internal audit of the Blueprint Fellows Program, and its impact on student achievement. In their evaluation, DPS found that the Fellows Program produced strong incremental growth [in mathematics] across the year for all "grades and schools."
Dreambox for Middle School	<p>By the time students reach middle school, gaps can widen and learners may already think of themselves as ‘good’ or ‘bad’ mathematicians. The truth is that every child can reach their full potential with effective support. DreamBox meets all learners where they are—and gets them to the next level—by providing the right next lesson at the right time, every time. “DreamBox earning Math provides outstanding differentiated instruction, adapting in a wide variety of ways to give students a better learning experience.” — John Bransford, James W. Mifflin University Professor of Education & Psychology, University of Washington, and Director of the LIFE Center</p> <ul style="list-style-type: none"> •Builds skills and closes gaps fast Support procedural fluency and the conceptual understanding, strategic reasoning, and problem-solving abilities every learner needs, plus 24/7 online access to keep students learning and building achievement. •Cultivates math confidence: Students engage in a motivating learning experience fueled by gaming protocols that helps them persist and understand even the most challenging concepts—and their own “math thinking.” •Adapts to the individual student: All ‘adaptive’ technology is not created equal. Continuous formative assessment, driven by Intelligent Adaptive Learning™ technology, analyzes over 48,000 data points per student, per hour to provide the right next lesson at the right time for each learner. •Empowers teachers: Teachers can differentiate instruction with powerful, standards-aligned data that enables them to coach skills in-the-moment, for immediate results. •Rigorous curriculum: Our challenging K–8 curriculum aligns to U.S. and Canadian standards.
Everyday Math	Real-life problem solving, student communication of mathematical thinking, and appropriate use of technology. This curriculum also emphasizes balancing different types of instruction (including collaborative learning), using various methods for skills practice, and fostering parent involvement in student learning. Recommended In Research Study; Primary curriculum; 11% average improvements in math scores, as evidenced by 72 non-rigorous studies. As a standard curriculum goes, this is better than most and is a true curriculum (not supplemental)
Get the Math	GTM is a multimedia project that combines video and web interactivity to help middle and high school students develop algebraic reasoning skills that form a critical building block for mathematical literacy. GTM lessons begin with video segments profiling young professionals, who then pose challenges connected to their jobs to teams. Problem-based learning typically used in after-school programs. Since 2011, Get the Math has reached 240,000 web users and aired in 54 percent of U.S. TV households in 92 markets across the country. Formative evaluation found Get the Math helped students produce more sophisticated algebraic solutions and identify ways algebra is used in the real world, while teachers rated Get the Math positively for educational value, usefulness and student engagement.
Khan Academy	Khan Academy offers practice exercises, instructional videos, and a personalized learning dashboard that empower learners to study at their own pace in and outside of the classroom. We tackle math, science, computer programming, history, art history, economics, and more. Our math missions guide learners from kindergarten to calculus using state-of-the-art, adaptive technology that identifies strengths and learning gaps.

Ko's Journey	Mentored video game play, where students use math skills to help Ko survive her adventure in a primitive world. Note the same author/designer is coming out with a new product, Empires, soon. Supplemental. Only one study, and the absolute gains in test scores are unknown. However, in that study, the curriculum doubled the percent of students deemed "proficient" on state tests.
Math Counts	The Math Video Challenge empowers students to be math teachers, video producers, actors and teammates by creating videos that explain and solve challenging real-world math problems. Teams of four middle school students create videos solving a problem of their choice from the MATHCOUNTS School Handbook and explain the real-world application of the math concept on which the selected problem is based. College scholarships are available for national winners. Problem-based learning typically used in afterschool programs. WestEd evaluation reported "The overall findings of this evaluation show that the project-based Reel Math Challenge (renamed MathCounts) increased student learning in math and in a wide range of 21st century skills such as critical thinking, communication and collaboration. Results of the student surveys and interviews clearly indicate that students in grades 6 through 8, who participated in the Reel Math Challenge in 2012-2013, reported high levels of engagement in their projects."
Math Pathways and Pitfalls	MPP is an intervention curriculum founded on core principles for how children learn mathematics and a vision of rigorous and equitable academic achievement. This discussion-based curriculum has a dual focus on building mathematical concepts and developing mathematical language, with an overall goal of effective and equitable learning. MPP provides a model for teaching and learning mathematical concepts that can be applied to mathematics lessons in any adopted curriculum. Results from an efficacy study indicated that exposure to MPP over two years raised mathematics test scores for the full sample of students and for the sub-samples of Latino students, English learners, and English-proficient students. When comparing two years of MPP experiences to one year, effect sizes were as high as .40 for English learners and .29 for Latinos on standardized mathematics tests. These findings suggest that MPP adds considerable value to the regular mathematics curriculum in promoting mathematics achievement.
Power Teaching Math	PTM uses a cooperative structure to help teachers create a learning environment in which students support each other's learning through discussion of challenges and errors, on-the-spot explanations, and motivation to contribute to the success of the team. As teachers become comfortable with the new framework, students become responsible for their own learning as well as for helping their teammates learn. Problem-based learning that can be applied to any curriculum. 14 randomized experiments or quasi-experiments have been conducted to ascertain the effectiveness of PTM (under its original name, STAD-Math) in diverse settings and with students of various age groups. Students participating in the program gained a full year more than students in a randomized comparison group and had a greater liking of math and higher self-concept in math. PTM cooperative learning structure teaches students to think critically and problem solve, communicate efficiently, and collaborate effectively with their peers.
Reasoning Mind	Reasoning Mind is a nonprofit with a mission to provide a first-rate math education for every child. To achieve this goal, Reasoning Mind partners with schools to provide an interactive, online mathematics curriculum for elementary and middle school students. The program ignites students' interest in math, develops higher-order thinking skills, and prepares them for algebra—the "gatekeeper" course to college. In addition, Reasoning Mind offers ongoing professional development, training, and in-person support for teachers and administrators using the program. Reasoning Mind serves 95,000 students across nine states and expects to reach 300,000 by 2018. Evaluations of the program are conducted annually and show consistently positive results including significant increases in students' standardized math test scores, higher class time spent on task, and an increased interest in math and related careers. Multiple independent evaluations have also confirmed the program's impact.

<p>TI MathForward</p>	<p>TI MathForward is designed to support and complement any core math curriculum by providing targeted instruction and practice in essential math concepts, skills, and strategies. It provides support, so all teachers can deliver high-quality, consistent instruction. It helps students communicate their mathematical thinking through collaborative learning facilitated by technology and provides immediate feedback to teachers and students regarding the state of their mathematical knowledge. A study from 2008 study by SRI found: “The overall model results indicated that MathForward participation was associated with significantly higher gains in mathematics achievement, when compared to students in the district not in the program...Furthermore, except for Hispanics in 9th grade, there was no evidence from this study that achievement gaps were losing for students in the program, relative to students not in the program...These results are suggestive of the promise of the intervention, but the models tested here do not permit us to conclude that we have unbiased estimates of program impact.”</p>
<p>The Expert Mathematician http://www.expertmath.org/</p>	<p>The Expert Mathematician is designed to help middle school students develop the thinking processes for mathematical applications and communication. A three-year program of instruction, The Expert Mathematician uses a software and Consumable print materials package with 196 lessons that teach the Logo programming language. Each lesson ranges from 40–120 minutes, or one to three class periods. The coursework combines integrated computer software with workbook activities. A test of unit concepts is administered at the end of each instructional unit. The developer used the computer program LogoWriter to develop the curriculum, which covers general mathematics, pre-algebra, and algebra I. Tools do not require extensive training for teachers, instead it reduces teachers’ lesson planning time.</p>
<p>University of Chicago School Mathematics 2 http://ucsmc.uchicago.edu/secondary/overview</p>	<p>The University of Chicago School Mathematics Project (UCSMP) 6–12 Curriculum is a series of yearlong courses—(1) Transition Mathematics; (2) Algebra; (3) Geometry; (4) Advanced Algebra; (5) Functions, Statistics, and Trigonometry; and (6) Pre-calculus and Discrete Mathematics—,emphasizing problem solving, real-world applications, and the use of technology. The program is designed to allow schools to offer the appropriate math to students regardless of grade level. Beginning with the Algebra course, technology is used in the classroom to aid in the development, of properties and skills, and graphing calculators are used to complete assignments at all levels.</p>
<p>MathForward https://education.ti.com/en/us/professional-development/mathforward</p>	<p>The Texas Instruments MathForward program combines TI technology with coaching and professional development. Both educators and students benefit from the program. The MathForward program was created to reduce the achievement gap between diverse student populations. It has been applied equally well in classrooms with proficient, struggling, English Language Learners and Special Needs students. MathForward is a for-profit program that: follows a consistent, systematic approach; focuses on skills and strategies that students need to be effective problem solvers; includes embedded (real-time) formative assessment; allows teachers to easily personalize instruction; incorporates integral professional development and in-classroom coaching; and recognizes the importance of home-to-school communication. MathForward is designed to support and complement any core math curriculum by providing targeted instruction and practice in essential math concepts, skills, and strategies. It provides support, so all teachers can deliver high-quality, consistent instruction. It helps students communicate their mathematical thinking through collaborative learning facilitated by technology and provides immediate feedback to teachers and students regarding the state of their mathematical knowledge. MathForward is based on the latest research on systemic change in math education.</p>

Appendix D: Evaluation Plan - IEval
GLBRA Middle School Mathematics Evaluation Requirements

As a district/school applying for funding through the Great Lakes Bay Region Middle School Mathematics Project, you are agreeing to fully participate in the external evaluation of the impact of this program on your teachers, students, and district/school. The evaluation is being conducted by iEval, an external evaluation firm with expertise in mathematics professional development projects, led by Dr. Wendy Tackett. The following theory of change, related to the implementation of high quality professional development, research-based curriculum, and best practices in supportive programs, guides the evaluation design.

When you submit your application for funding, you are agreeing to participate in the following evaluation components:

Evaluation Component	Time Commitment	Year 1	Year 2	Year 3
Online survey of building and district administrators involved in the project	10-15 minutes per Administrator	X		X
Online survey of teachers participating in the project	10-15 minutes per teacher	X	X	X
Online teacher test of pedagogical content and/or content knowledge	30-60 minutes per teacher	X		X
Observations of professional development and/or implementation of innovative programs by the evaluation team	60-90 minutes	X	X	
Classroom observations of teachers participating in the project	45-60 minutes per teacher	X		X
Sharing of state mathematics assessment data	Annually	X	X	X
Sharing of district mathematics assessment data (e.g., NWEA, Performance Series)	Annually	X	X	X

The evaluation team will provide initiative level evaluation reports and district-specific reports annually. Additionally, formative evaluation reports will be provided as available to be used to improve the ongoing implementation of services (e.g., baseline report after first teacher observations and pre-testing). Costs for the initiative level evaluation are \$2,800 per teacher over the three-year grant period

Appendix E: Request for Proposals to Improve Middle School Math

Great Lakes Bay Regional Alliance (GLBRA)

Science, Technology, Engineering, and Mathematics (STEM) Proposal Guidelines

The GLBRA STEM networks facilitated by Saginaw Valley State University (SVSU) and Central Michigan University (CMU) were assigned two sets of recommendations from the research report entitled “Building a Robust STEM Talent Pipeline in the Great Lakes Bay Region”: 1) Career and College Ready Students; and 2) Sustained by a Culture of STEM. Both networks focused on the same recommendation - improving middle school math, given its critical role in moving students to STEM careers.

STEM education has been a targeted concern for Michigan employers and educators for at least the past decade. Schools have implemented STEM educational programs and activities, yet despite considerable efforts, math scores do not show that middle school students achieve in math. The pipeline needs strengthening. The focus of this call for proposals is to address middle school students' math achievement that currently weakens students' options as they progress through their educational years.

Eligibility: To support STEM education that gives middle school students an opportunity for improving their math understanding and skills, funders are inviting proposals from schools, public and private, and non-school based organizations to propose projects that will raise middle school students' math achievement. Middle school students are defined in the STEM Report as grades 5th to 8th, but the submitting entity may choose which grade(s) to target based upon their own definition of middle school.

There are three options in which a school, school district, non-profit may request/receive grant dollars from a funding source supporting the STEM Impact Initiative:

Option A:

Submitting a proposal to implement one of two nationally-recognized, evidence-based middle school math programs recommended by the STEM Networks at SVSU and CMU. These programs are:

- ST Math (Mind Research Institute)
- I Can Learn® Education System

Option B:

Submitting a proposal to implement two nationally-recognized teacher development program shown to improve middle school math achievement recommended by the STEM Networks at SVSU and CMU. These programs are:

- Virginia Mathematics Specialist Program
- Professional Learning Community

See Appendix B for descriptions of Options A & B.

Option C:

Submitting a proposal for a creative program (in-school, out of school or a combination of) that has proven results for increasing middle school math achievement. Such programs could include math coaches, professional development, professional learning communities, on-line programs,

hybrid programs, tutoring, after-school programs, math camps, STEM field experiences for teachers, family outreach, and any combination of these approaches. No one approach will automatically be precluded from consideration. Innovation and a variety of approaches to improving middle school math are encouraged. A list of these approaches recommended in the research phase of the study, the STEMWorks database for Change the Equation, and other approaches identified by the STEM Networks can be found in Appendix C.

These programs can also be in partnership with non K-12 entities, including business, youth programs, internet-based programs, community-based organizations, public libraries, and parent programs. This list provides examples, but is not meant to be inclusive or exclusive. The site(s) and site partner(s) definition is open and all are welcome, but the end result needs to be an increase in middle school math achievement/scores. Successful proposals should have a strong tie to a body of research literature that provides a clear demonstration of impact on students' math scores through measureable outcomes. **Note:** Applicants may submit a proposal outside of the three categories, but this may limit the probability of funding.

Timeline

March 4	Release of RFP
March 9 & March 16	Webinars 4:00-5:00pm https://attendee.gotowebinar.com/rt/6684589066073656065
March 18	Intent to Apply is not binding but helpful to potential funders & reviewers https://www.surveymonkey.com/r/STEMMiddleSchoolMath
April 22 by 4:30pm	Proposals Due online at http://svsu.infoready4.com Review proposals sent to submitting parties Hiring of Fiscal/Administrative Agent and Independent Evaluator
May 17	Year 1 sites notified of awards
July 1	Sites begin implementation

A number of proposals will be funded to improve math achievement/scores of middle school students in the public and private schools and non-profits in the GLBRA Region (Arenac, Bay, Clare, Gladwin, Gratiot, Isabella, Midland, and Saginaw counties). Projects can be for a duration of 1-3 years, however, if funded each applicant will need to re-apply each year for subsequent funding. Previous year's performance is a consideration of continued funding; continued funding is not guaranteed. The funders have an interest in impacting student's math achievement/scores in each middle school in the eight counties and funding decisions will consider parity across these counties.

Proposals must comply with all submission instructions and guidelines in order to be considered for funding. Proposals should be up to 6 pages in length single spaced (excluding title page, budget narrative, and appendix materials. The document should be formatted using 12 point font (Times New Roman, Arial, or Courier) with 1-inch margins.

Reporting

An Annual Project report, due July 30 yearly or the following business day, is required and the funders reserve the right to establish additional requirements of grantees at the time of award. All sites must agree in writing to provide data supporting evidence of success, as articulated by the evaluator contracted to work with each funded entity to develop a quantifiable evaluation plan. A brief (one-page) interim report is due quarterly to the STEM networks. Pilot sites will also be invited to present in person at a regularly schedule STEM network meeting, to be held at either Saginaw Valley State University or Central Michigan University.

Publications and Presentations

Publications resulting from the work of this project must acknowledge support from the funders. Awardees will be required to submit information for the GLBRA www.stempipeline.com website that includes project title, middle schools in the project, description of activities, and outcomes.

Projects that are funded will be required to present at a local conference held yearly in June, and provide material to publish on the www.stempipeline.com website hosted by GLBRA.

Webinars - Two grant webinars will be held – March 9 from 4:00-5:00pm and March 16 from 4:00-5:00pm. Recorded webinars will be available on the GLBRA website.

See this link to join the webinar: <https://attendee.gotowebinar.com/rt/6684589066073656065>

All questions related to this call for proposals must be provided in writing to STEMMiddleSchoolMath@svsu.edu no later than one month after the webinars. Responses to all questions will be posted at the Frequently Asked Questions site that will be updated regularly through April 15, 2016 at the GLBRA www.stempipeline.com

Proposal Submission and Review Process

Proposal material must be submitted as a pdf document in the order listed and uploaded to the following website: <http://svsu.infoready4.com>

Scroll down to - GLBRA STEM Initiative - Improving Middle School Math

Due Date – Friday, April 22, 2016, at 4:30 pm.

After the proposal review process is completed, project directors will be notified via email by Tuesday, May 17, 2016. All decisions are final. Once awarded, the initial meeting with the GLBRA project/fiscal administrator will be scheduled on a quarterly basis.

Proposals will be reviewed by representatives connected to the STEM Networks and the Steering Committee without a conflict of interest.

Proposal Selection Criteria:

- Math scores of population served (e.g. last three years)
- Teacher/staff administrative support for change
- Geographic distribution across the Great Lakes Bay Region
- Commitment to participate in ongoing evaluation
- Project sustainability
- Reasonable budget

**Request for Proposals
Improving Middle School Math
GLBRA STEM INITIATIVE**

I. Contact Information

Project Title:	Use the online form for this page	
Date:		
Submitting Organization(s):		

Project Director:		
Title:		
Organization:		
Address:		
Telephone Number:		

Additional Team Member:		
Title:		
Organization:		
Address:		
Telephone Number:		
Role in Project:		

Additional Team Member::		
Title:		
Organization:		
Address:		
Telephone Number:		
Role in Project:		

If more team members are involved in the proposed project, please list them on a separate page as an attachment to the proposal.

II. Non-Technical Summary

Provide a 250-word summary suitable for a non-technical audience. Include who, what, when, where, and how this project will improve math scores for middle school students.

Use the online form for your abstract

III. Project Description: this section is limited to 6 pages and uploaded

A. Problem Statement – Define the problem(s) addressed by the project. This should include relevant data (e.g. current math scores) by grade for the middle school students you propose to serve, which can serve as baseline data for identifying increases in math achievement.

B. Project Description - Specify the goal and objectives of the project, including a rationale for selecting the program or approach to be taken, a description of the target population, and resources needed for a successful implementation.

C. Measurable Outcomes – Specify what outcomes will be expected during each year of the project as well as anticipated long-term outcomes which will be tracked and reported to the GLBRA STEM Steering Committee., including any expected increases in math achievement and number of students and teachers impacted. Reference can be made to other schools or school districts which have already implemented the program.

D. Project Timeline – Identify and briefly describe project activities by month.

E. Sustainability - Describe how the proposed program or approach will be sustained by the organization once initial funding is expended. The description should include on-going financial support for personnel, licenses, and purchases, as well as infrastructure—how will organizational processes be sustained long-term to assure the continued support of the program.

F. Capacity - Describe the capabilities of the submitter, including existing resources, internal and external support for the project, experience of key personnel, and other factors which can contribute to the success of the project. Include Project Director Resume and Team Bio sketches in the Appendix.

G. Evaluation – Include a statement that the submitter agrees in writing.

I agree to:

- 1) work with contract evaluator to establish an evaluation plan that includes both quantitative and qualitative data and
- 2) provide all needed data in a timely manner as requested by the contracted evaluator; and
- 3) track outcome data after the initial 1-3 year funding period to ascertain long-term impacts.

H. Scaling and Replication: Describe how the submitter might scale the project to include additional students, schools, and grade levels in the future if results are positive. Describe whether and how assistance would be provided to schools across the region interested in replicating the model.

Budget and Budget Narrative: this section is limited to 3 pages and uploaded.

Provide a list of costs including personnel, benefits, equipment, supplies, travel, contracts, and “in-kind” resources for the first year of the project.

Limitations:

- Teacher(s)/administrator(s) compensation in the summer is limited to \$150/day including benefits.
- Requests for capital equipment (any one item over \$5,000) are discouraged; however a limited amount of capital equipment funds may be included in the proposed budget with justification for how the equipment is a necessary element to program success

- Supplies and materials, excluding specific math program materials or software, should not exceed more than 20-30% of the total budget; if technology is proposed, it must directly support increasing student math scores.
- Consultants are limited to \$1,000/day plus travel.

Requirements:

- Each project is required to include 5% of total direct costs for an independent Project Evaluator, who will be hired by GLBRA.
- Indirect costs are limited to 8% of total direct costs to the fiscal/administrative agentⁱ.
- Each project is required to include \$2,000 for project site administrationⁱⁱ. Projects will be reimbursed for actual expenses monthly or quarterly after submitting the required documentation to the fiscal/administrative agent.
- Each project must provide a cost per student, based upon the total budget and the number of students to be served during each year of the project

Appendix: upload as one document in this order.

1. **Resumes** of Project Director - **limited to 2 pages** - and ½ page bio sketch for each Team Member. The site Project Director must be a current full-time employee with the school district or non-school based organization, preferably with experience in working with children and a background in education.
2. **Annotated Citations: (not to exceed 5)** Include a list of annotated citations explaining how the proposed program supports raising middle school math scores. If the applicant has chosen one of the evidenced based programs listed, there is no need to repeat the citations here.
3. **Letters of Support:** a) Letter of support from the Authorized Representative (the person in your organization with the authority to bind the organization to contractual terms) that indicates commitment for the time and effort of the Project Director during the academic year, support for the current project, and support for sustaining the proposed project to improve math scores for students once funding ends.
b) Letter(s) of support from each partnering organization's Authorized Representative with a description of the organization's role to raise middle school students' math scores, if applicable.

ⁱ The **fiscal/administrative agent** who receives 8% of the project's costs will be responsible for guidelines/parameters for carrying out a project and for consistent reporting; determining fiscal capability of the project site administration (due diligence); paying the monthly/quarterly invoices after reviewing the supporting documentation from the projects; and supporting the conference arrangements yearly. The fiscal/administrative agent would issue the contracts to the project sites, and the project evaluator. Should disciplinary action be needed, this would be the responsibility of the fiscal/administrative agent. The fiscal/administrative agent would provide yearly fiscal reports to the funders.

ⁱⁱ The **project site administration** is the site where the project takes place. For example, if the site is a school district, the \$2,000 funding would support the preparation of the monthly/quarterly invoices, ordering of materials, etc.