



**Ohio's Race to the Top Innovative Programs Grant Application**

**Application Period- March 11-April 8, 2011**

Please ensure that ALL questions are answered completely in each of the four sections, as incomplete applications will not be returned for modifications or completion.

**Section A 1. General School Information**

<p>a) <b>Name of Applicant (LEA):</b> Ansonia Local Schools</p>	<p>b) <b>Name of School(s):</b> *Ansonia Local, Fort Recovery Local, Mississinawa Valley Local, New Bremen Local, New Knoxville Local</p>
<p>c) <b>Superintendent of Schools: (or equivalent)</b> Name: Jim Atchley, Superintendent  Address: 600 East Canal Street Ansonia, Ohio 45303  Telephone: 937-337-4000 Fax: 937-337-9520 Email: <a href="mailto:jim.atchley@ansonia.k12.oh.us">jim.atchley@ansonia.k12.oh.us</a></p>	<p>d) <b>LEA RttT Contact:</b>  Name: Jim Atchley, Superintendent  Address: 600 East Canal Street Ansonia, Ohio 45303  Telephone: 937-337-4000 Fax: 937-337-9520 Email: <a href="mailto:jim.atchley@ansonia.k12.oh.us">jim.atchley@ansonia.k12.oh.us</a></p>
<p><b>School Vision:</b>  <b><u>Mercer, Auglaize, Darke Counties for STEM</u></b>  <u>Our collective Vision:</u> The vision of the <b>MAD for STEM</b> consortium is to create equal and expanded STEM opportunities for all K-12 students regardless of gender, socio-economic class, and culture.</p>	<p>e) <b>School Mission:</b>  <b><u>Mercer, Auglaize, Darke Counties for STEM</u></b>  <u>Our collective Mission:</u> The mission of the <b>MAD for STEM</b> consortium is for <u>all</u> students to possess 21<sup>st</sup> Century Skills, become confident and knowledgeable decision makers, and value life-long learning.</p>
<p>f) <b>Primary Goals of School:</b> <b>MAD for STEM</b> consortium goals are: 1) All students will be able to enter a college-level course in the areas of Science, Technology, Engineering, and Math without the need for remediation. 2) All students will attack complex problems, collaboratively develop innovative solutions, communicate effectively, and apply practical applications through instruction that is inquiry-based and aligned to Ohio Revised Content Standards. 3) All students will be prepared to compete locally, nationally, and globally. 4) All students will look beyond their current reality and see educational and career</p>	<p>g) <b>Teacher/Student Ratio:</b>  The teacher/student ratio for the participant districts is: Ansonia 18.2 Fort Recovery 20.5 Mississinawa Valley 18.1 New Bremen 21.5 New Knoxville 18.4  The combined teacher/student ratio is 19.9</p>

possibilities.

**PLEASE NOTE: In you enter into a collaboration with another LEA, please mark with an \* who the FISCAL AGENT will be if selected for one of the competitive grants.**

h) **Names and titles of individuals who participated in the March 10<sup>th</sup> Innovation Symposium :**

**Ansonia Local:** Jim Atchley, Superintendent

**Fort Recovery Local:** Shelly Vaughn, Elementary Principal

**Mississinawa Valley Local:** Lisa Wendel, Superintendent

**New Bremen Local:** Ann Harvey, Superintendent; Brian Puthoff, Technology Director

**New Knoxville Local:** Linda Tebbe, 7-12 Principal; Nick Wirwille, Technology Director

**Auglaize County ESC:** Karen Smith, Curriculum Coordinator

**Mercer County ESC:** Jeff Tuneberg, Curriculum Coordinator

## **2. SCHOOL PROFILE**

<b>STUDENT INFORMATION</b>		
<b>Grades served:</b> All districts serve grades K-12		
<b>Enrollment (total number of students served in school applying for Innovative Program):</b>		
<b>Grade Level</b>	<b>Enrollment</b>	
Pre K-5	1,729	
6	271	
7	278	
8	270	
9	287	
10	285	
11	289	
12	272	
<b>Ethnicity and gender data (% of enrollment):</b>		
Black: 0.001%	White: 96.5%	Male: 50.4%
Asian/Pacific Islander: 0.0001%	American Indian/Alaska Native: 0.0001%	
Hispanic: 1.90%	Multi-Racial: 0.01%	Female: 49.5%
<b>Percent of students eligible for free/reduced lunch:</b> 26.60%		
<b>Percent of students identified as special education:</b> 16.5%		
<b>Names of current competitive grants LEA has been awarded (2010-2011):</b> Learn and Serve- Mississinawa Valley, Spark PE- Mississinawa Valley Honda of America and Martha Holden Jennings- Fort Recovery and New Bremen		
<b>Please attach 2009-2010 school Report Card:</b>		

## Section B

1. Please check circle(s) next to the specific Innovative Program(s) for which you are applying. Prioritize your preference order to the right of the program, with "1" being your first priority. **A separate application must be submitted for each Innovative Program.**

- |  |              |
|--|--------------|
| <input type="checkbox"/> <i>Asia Society (International Studies Schools Network)</i> | _____        |
| <input type="checkbox"/> <i>AVID *</i>   | _____        |
| <input type="checkbox"/> <i>Early College High School</i>                            | _____        |
| <input type="checkbox"/> <i>New Tech Network</i>                                     | _____        |
| <input checked="" type="checkbox"/> <i>STEM*</i>                                     | <u>  1  </u> |

**\*Priority may be given to the lowest-achieving schools**

## Section C

**Questions Addressing Innovation Selected-** Please answer these questions in the text boxes provided. Provide as many details as possible so that the reviewers can gain a good picture of your school.

1. Identify your selected Innovative Program and the reasons for selection.

## MAD for STEM!

### Mercer, Auglaize, Darke Counties for STEM

Following the Innovation Symposium, the five rural school districts formed a consortium to develop a comprehensive STEM innovative program proposal to initiate, enhance and expand STEM education in three counties: Fort Recovery in Mercer County, New Bremen and New Knoxville in Auglaize County, and Ansonia and Mississinawa Valley in Darke County. Other partners in this endeavor are the ACE Academy Charter, Auglaize County ESC, Mercer County ESC, and Tri Star Career Compact.

National, state, and local needs drive this proposal for our five-school rural consortium. National research indicates that across our country manufacturers are facing a critical gap in science, technology, engineering, and mathematics expertise. According to the U.S. Department of Education, in 2006 China produced 600,000 engineers, India produced 465,000 engineering graduates, and all of Europe produced 100,000, while the U.S. produced only 70,000. These statistics are disturbing when considering that jobs requiring science, engineering, or technical training in the United States will increase 24 percent between 2004 and 2014. A 2006 Wright State University study of West Central Ohio indicates that 25 communities within the region have concerns regarding the workforce skills gap. Of the 1300 interviews conducted in the study, 583 companies reported workforce challenges related to skills gap shortages in both the current and future labor pools. The Business Advisory Council of West Central Ohio reports that manufacturers in the effected counties are outsourcing their work in order to find qualified labor.

One of our goals is to expand the already successful STEM programs of Fort Recovery and New Bremen to Ansonia, Mississinawa Valley, and New Knoxville; thus, creating a solid foundation for more students to become innovators and inventors, self-reliant and logical thinkers, and technologically literate problem solvers. Additionally, all students will gain an acute awareness of the ever-challenging engineering/technical world. Fort Recovery and New Bremen have been deemed (by the Ohio Board of Regents in collaboration with Battelle and the Ohio STEM Learning Network) the "quintessential K-8 STEM Program of Excellence." Their expertise and experience with STEM teaching and learning can be replicated and shared with the rural districts. In addition, their own programs can be expanded and enhanced to offer additional premier opportunities for students.

Through the **MAD for STEM** Program – Ansonia, Fort Recovery, Mississinawa Valley, New Bremen and New Knoxville shall jointly attack the critical workforce skills issue. Through MAD for STEM, teachers will change the way they teach, and students will change what and how they learn. In the end, students will graduate ready to achieve successfully in the "flat world" of the twenty-first century. Nothing is more important for our students, for our communities and for our country. Our Boards of Education have and will continue to make substantial investments in technology and professional development to support the initiation and continuation of STEM programs.

The **MAD for STEM** Program will provide personalized, continuous progress for all students and will address different learning styles, cultural backgrounds, and rates of development. The program progresses from STEM basic content and explorations to a culmination of open-ended challenges, thus, making it possible for teachers to modify the content and activities to meet the needs of all students. In addition, EIE, GTT, and PLTW modules were designed with the interests of females, economically disadvantaged, and minority students in mind (all underrepresented in the engineering field), and with materials and activities appropriate for the cognitive/ motor skills of the targeted age group.

2. In what other school transformation strategies has your school been engaged and its/their status.

All five districts have been implementing **Formative Assessment** practices throughout their respective districts. We understand that true formative instruction is about deliberate and intentional practice, and we are committed to and continue to implement small and strategic changes in teacher and leadership behaviors through professional development opportunities. We have committed our RtT dollars to support job embedded learning that will provide teachers an opportunity to work collaboratively on implementing formative instruction. We also understand that students are at the heart of formative instruction practices and our students thrive in target-rich environments where they can articulate the learning targets, use rubrics, and give and receive feedback.

We understand that formative assessment is a process. It is about what we do with the results of assessments that really make a difference. Each district is at varying levels of implementation in formative instructional practices. We will continue spending time and resources on teacher practices through multiple supports such as Professional Learning Communities, Grading Fixes, Walk-throughs, and AIMS web all of which provide data that lead us to the next step in the transformation of our districts. For transformation to actually take place, professional development needs to be job embedded and measured.

Two districts, Ansonia and Fort Recovery, will participate in **Project SOAR through Battelle** for Kids and Fort Recovery has received value added data since 2005. Fort Recovery has also been a pilot district for **T-CAP (Teachers Connecting Achievement and Progress)** where teachers in grades 3-8 have received and are using teacher level value added data to improve instruction. In both districts we have created opportunities to recognize excellence and educators have developed an appetite for excellence. We communicate with teachers and students about people, not test scores. We have noticed transformational change, as educators understand their students' growth and learning process. Continued professional development is necessary to ensure that teachers and leaders understand and are able to interpret the data. This empowers teachers to adjust instruction so that their students will perform at higher achievement levels.

**eDays - Calamity Days on Line** – This program, piloted by Mississinawa Valley Schools, approved by ODE, and is currently a component of Ohio Law for all Ohio schools. Other districts in the consortium will be using what has been learned to guide their implementation as a method for full immersion of the classroom teacher in the use of technology to enhance, extend, and individualize instruction.

**Problem-based Learning** – All districts of the consortium unilaterally believe that project-based learning supports and reflects the work students will be called upon to do in the world of work and higher education beyond our doors. We have each begun the process of staff development and subsequent classroom implementation. Our students engage in authentic projects addressing real-world problems. Assessments often include informal and formal presentations of learning. Tri Star Career Technical Center students develop Career Passports using a competency-based test. Our teachers have participated with Dayton Regional STEM Center for professional development in Inquiry-based instruction.

**Dual enrollment / AP / Articulations** – Choice, options, and flexible opportunities for learning are evident in all districts. These are available for high-level advanced high school classes at traditional high schools, Tri Star Career Compact, and Miami Valley CTC. All these opportunities provide college credit and enable a smooth transition to post-secondary options.

**End of course exams** – Several districts within this consortium will begin utilizing end-of-course exams in core subjects in FY 11-12 to obtain base-line data to increase rigor and provide consistency.

3. Describe the capacity your LEA/school has to ensure a successful implementation.

The record of accomplishments for the consortium districts is impressive in the area of capacity and commitment in best practices and innovative professional development and the sharing thereof. The consortium schools have a reputation for continuous improvement and academic success. Ansonia and Mississinawa are Effective, Fort Recovery, New Bremen and New Knoxville districts are Excellent or Excellent with Distinction. Among the proposed consortium exist Blue Ribbon Schools, Project Lead the Way National Certified schools, a recipient of The 2010 Presidential Award for Mathematics Teaching, and were one of three districts in the nation to participate in a national telecast from Washington, D.C. on the use of data and making school improvements.

Professional days and state granted waiver days are built into the school's yearly calendar for staff to collaborate, make data-driven instructional decisions, share best practices, and receive trainings from experts in the field of education based on staff needs. Fort Recovery and New Bremen have trained Engineering is Elementary, Gateway to Technology, and Project Lead the Way teachers that can coach and mentor new teachers. Ansonia, New Knoxville, and Mississinawa Valley will be using these pockets of excellence to implement their own STEM strategies. By collaborating with the schools, the long-term benefits for both entities become evident. Schools do a better job of engaging learners and producing quality graduates, and businesses have a better workforce!

The community, business and higher education partners will play a major role in the **MAD for STEM** Program's Professional Development Plan. In 2006, Christine Cunningham, the Vice President of Research at the Museum of Science, Boston, shared the results of her research: "For the most part, teachers (grades K-8) had little or no experience in teaching engineering lessons to their students." With her research in mind, **MAD for STEM** has designed the Professional Development Plan with opportunities for teachers to collaborate with other districts, higher education, and business partners. The business community will augment the teachers' selection of curriculum, materials, and equipment to help create relevant, real-life activities. Businesses will also serve as a useful and pertinent resource for teachers as questions arise.

A website, MAKE-it STEM.org, was developed upon implementation of our STEM programs and highlights past accomplishments. With this RttT Innovative Programs grant, we will utilize the Ohio School Learning Network's website to update and disseminate information. Furthermore, we will strive to strengthen our relationship through this communication network to enhance sharing of expertise while building new partnerships.

Our districts are committed to infusing technology in the curriculum as a strategy to improve teaching and learning while increasing relevancy for students. We share the goal of producing technologically literate students. The **MAD for STEM** initiative enhances our opportunity to engage students through technology. We are already working in our districts to become wireless and provide one-to-one initiatives. While requesting minimal support for capital improvements, our in-kind contributions will be strong as we provide technology that is significant for our **MAD for STEM** goals.

A **MAD for STEM** Coordinator will facilitate new elements and coordinate professional development among the five districts. The coordinator will serve as a liaison with the Ohio STEM Learning Network to insure fidelity between the OSLN philosophy and our **MAD for STEM** program. Additionally, the coordinator arranges for teachers and students' field trips, offers project guidance, provides real-world applications, a strong knowledge base, and engineers for demonstration /judging, raises career awareness, and serves on the steering committee.

4. How will you integrate the specific Innovative Program into your school culture and current transformation plan/Scope of Work?

The **MAD for STEM** program will fit naturally in elementary, middle school and high school with the current and Revised Ohio Academic Content Standards in math, science, and technology. Through curriculum such as EiE, GTT, and PLTW, students will have opportunities for personalized and self-directed learning. Students will be involved in the mathematical concepts of problem formulation, testing of alternative solutions, and evaluation of data. The curricula are not “extras” for the teacher, but rather excellent complements to the already existing math, science and technology curriculum designed to meet Ohio’s Revised Content Standards. The GTT and PLTW courses will reinforce the national content standards for K-12 Engineering and Engineering Technology by the American Society of Engineering Education. Cross-curricular scientific-based units will incorporate content standards from other subjects (i.e. the Entrepreneurship Standard in social studies). The use of 21<sup>st</sup> century technologies and on-line learning will enable us to enhance and expand student learning opportunities.

Ansonia, Mississinawa Valley and New Knoxville Local Schools will offer STEM initiatives based on models from Fort Recovery and New Bremen. All districts will explore and share best practices within the collaborative and beyond through our partnership with the Ohio Stem Learning Network. The development of professional learning communities that include teachers and leaders from all five partnering school districts will enhance instruction and integration of STEM concepts with the Ohio Revised Academic Content Standards in our Scopes of Work in Standards and Assessments in Assurance Area B and enable Great Teachers and Leaders in Assurance Area D.

**MAD for STEM** will strengthen our curriculum and instruction. It integrates science, technology, engineering, and mathematics in ways which engage students and provide opportunities for students to work in project-based/team settings. All educators will be directly involved in professional development activities resulting in inquiry based education for all students. The projects and learning that occur will involve all curricular areas and will include all students and staff as well as stakeholders.

As outlined in our Scopes of Work, we will expand existing partnerships with our university partners, Wright State University, Findlay University, and Sinclair Community College. Partnerships will also be expanded with local industry experts (e.g.) Productive Concepts, Inc. and Anderson’s Ethanol, two companies specializing in alternative energy; Brookside Laboratories, chemical engineering; Crown Equipment Corporation, manufacturing and electrical engineering; Fort Recovery Industry and JR Manufacturing, manufacturing engineering.

5. How will implementation of this Innovative Program increase student achievement and progress in your LEA/school for ALL students?

**MAD for STEM** will create a solid foundation for all students to become innovators and inventors, self-reliant and logical thinkers, and technologically literate problem solvers. All students will participate in STEM lessons. These lessons are project/problem-based learning with high levels of student engagement. All students will be provided the same opportunities. The STEM curriculum will provide high levels of engagement in inquiry-based instruction thus increasing student achievement and progress.

**MAD for STEM** educators understand the need for high-quality formative assessments to guide instruction for all students. Formative assessments will begin as soon as projects begin. These assessments are quantitative (test scores, performance indicators, rubric results) and qualitative (staff and student surveys, teacher observations and evaluations, classroom walk-throughs, student self/group assessments). These assessments direct all continuous decision-making regarding implementation, professional development, and student achievement. With high-quality formative assessments guiding instruction, our students will demonstrate increased learning on summative assessments.

The **MAD for STEM** Program aligns with the Ohio Revised Content Standards. The modules and activities are not "extras" for the teacher, but rather excellent complements to the already existing math, science, and technology curriculum designed to meet Ohio's content standards. The EIE, GTT, and PLTW modules align with the Ohio Revised Math, Science, and Technology Content Standards. Students will be involved in the mathematical concepts of problem formulation, testing of alternative solutions, and evaluation of data. The GTT and PLTW courses will reinforce the national content standards for K-12 Engineering and Engineering Technology by the American Society of Engineering Education. Cross-curricular scientific-based units will incorporate content standards from other subjects (i.e. the Entrepreneurship Standard in social studies).

**MAD for STEM** has all the components of an effective inquiry-based design model: authentic, hands-on tasks; promotion of collaborative work; imbedded higher-order thinking questions; clear links to science and engineering concepts. As documented throughout our proposal, inquiry-based learning and teaching will be a priority. The students will be continuously engaged in quality inquiry-based learning during their math, science, and technology courses, as well as units across the curriculum.

**MAD for STEM** will provide personalized, continuous progress for all students and will address different learning styles, cultural backgrounds, and rates of development. The program progresses from STEM basic content and explorations to a culmination of open-ended challenges, thus making it possible for teachers to modify the content and activities to meet the needs of all students. In addition, EIE, GTT, and PLTW modules were designed with the interests of females, economically disadvantaged, and minority students in mind (all underrepresented in the engineering field), and with materials and activities appropriate for the cognitive/motor skills of all students.

6. How will you sustain this Innovative Program post RttT?

The **MAD for STEM** implementation will change the way teachers teach and students learn. **MAD for STEM** is a process, not a product, the consortium can give unqualified assurances that our STEM Programs will continue. We have an established and powerfully involved and committed group of business and community partners. We are confident they will continue to provide financial, capital and human resources. The schools have the unfailing support of the faculty, administrators, and Boards of Education. This consortium can give unflinching assurances that the financial, human and capital resources will sustain. While requesting minimal support for capital improvements, our in-kind contributions will be strong as we provide technology that is significant for our **MAD for STEM** goals.

The commitment to STEM already exists. **MAD for STEM** will become a part of the normal instruction for the new participating schools. Ansonia, Mississinawa Valley, and New Knoxville will incorporate *Engineering is Elementary, Gateway to Technology, and Project Lead the Way* lessons into their respective curriculum. **MAD for STEM** will support current instructional practices. Fort Recovery and New Bremen will expand upon their current STEM instruction with the following:

- expanding inquiry-based instruction into K-2
- expansion of field trips to include Wright Patterson Air Force Base
- on-line course offerings for classes such as Mandarin Chinese, Green Energy, Introduction to Web Design, and Computer Programming (see timeline and major activities under Question Nine, Section 4.0 for additional examples)
- addition of *Project Lead the Way* classes

By fostering partnerships with the participating schools and staff we can capitalize on each other's strengths. Enrichment activities can be completed together such as STEM camps and professional development among staff and resources for participating staff members. Administrators/faculty/parents and communities are committed and excited about STEM initiation and continuation.

#### Sustainability Plan

Boards of Education	Support for initiation and continuation of STEM (financial, human, capital resources)
Admin/Staff	Pledge involvement/support/collaboration, search/provision of grants/resources
Community	Pledge involvement, support (financial, human, resources)
Professional Development	On-going staff development aligned to state standards and aimed at High Quality Teaching. Collaboration between districts and Stem Collaboratives across the region and state. Focus on Inquiry Based Teaching and Learning, <i>EIE, GTT &amp; PLTW</i> . Provision of time for consortium staffs to collaborate/pursue personalized learning.
<i>IQB Cross-Curricular</i>	Will continue as inquiry-based PD and educational implementation/support grows. Financial resources from board PD budget line item, Martha Holden Jennings grant, business grants/funds.
<i>EIE/GTT/PLTW</i>	Continued integration of modules and/or classes into existing standards-based curriculum
Continuity of Staff	Low staff turnover assures continuity and sustainability of trained educators. Also assures that STEM staff will have support of trained/experienced staff on site.
STEM Camp	Will continue as annual summer STEM activity. Business Support/Student Fee according to parent ability to pay. PTO/Community/Business STEM Camp scholarships available.
Engineering Days	Designed by grade 5/6 staff. Yearly events will include <i>COSI on Wheels/</i> Presentations by wide variety of engineers. Funded by student activity funds, additional grants, and donations.
STEM Fair	Will continue in 7 <sup>th</sup> grade. Focuses on Science, Technology, Engineering, and Math. Advice, judging, and support continue from business and community partners.
Field Trips	Real world connections to engineering, engineering design and other STEM disciplines, student activity funds, building funds, student payment, volunteer bus drivers.
New Teacher Trainings	Commitment by school to provide for needed content and pedagogical training to insure continuation of STEM. Funded by additional grants and donations.
Materials	Conservative purchasing practice, Recycling emphasized, Provided by local community organizations if possible, Board funded, other grants and donations.

7. Describe any potential challenges or barriers with the mandatory professional development and Innovative Program requirements for the framework that you have selected. What strategies will your LEA/school implement to overcome these potential obstacles?

The biggest challenges identified by the shared stakeholders in our **MAD for STEM** plan are commitment, sustainability, and finances. As RttT districts, our teachers have already stepped up to the plate and voted to participate in district transformation. Each district has a dedicated, committed RttT Transformation Team in place. We recognize that in any transformation process obstacles and barriers inevitably arise. Our RttT Transformation Teams help create common ground to allow us to address the barriers and challenges that will occur.

The formation of the consortium of experienced STEM districts with "rookie" districts will help us overcome the first two barriers. Success with STEM has been substantiated and is a source of pride for our schools and communities. Most teachers are motivated to do anything and everything that "works" as they are committed to student success. Too often new programs have been top-down initiatives instigated by a single person's desire to lead change rather than maintaining the course long enough to evaluate and communicate the results of the change. Teachers who have weathered through many of these top-down initiatives have grown skeptical. Using teachers from the RttT Transformation Teams as leaders will give us a vehicle to overcome potential staff resistance to this established school improvement initiative. Refer to our response to question 6 which addresses our ability to sustain **MAD for STEM**.

Finances are an obstacle for all organizations including schools. Making decisions regarding expenditures requires prioritizing. Resources, such as time and money, must be allocated to those programs with the greatest potential to result in student success in college and career. Because STEM is a priority for area economic development, it must be a priority for schools whose focus is creating a competent workforce to aid in that growth. The consortium is confident this reality will continue to put STEM initiatives high on the priority list in the allocation of resources beyond the span of the grant. While requesting minimal support for capital improvements, our in-kind contributions will be strong as we provide technology that is significant for our **MAD for STEM** goals.

8. How will the implementation of this Innovative Program increase college and career readiness of all students?

The Engineering is Elementary (EiE) units taught in K-6 provide rich content knowledge across the grade levels. EiE is a featured program of Change the Equation. Change the Equation is a new national initiative focused on improving science, technology, engineering and math (STEM) education for every child. Each EiE unit features a specific kind of engineering. The project that is completed reflects the skills appropriate for the engineering discipline. Global connections will be increased through the EiE stories.

According to STEM research, Ohio's future prosperity depends on how well we educate our children and youth. A vital target area is middle school. Students between the ages of 10-15 are making critical and complex life choices every day. According to the National Middle School Association, "They are forming the attitudes, values, and habits of mind that will largely direct their behavior as adults" (*This We Believe*, 2003). This is a critical time to expose students to more career options and higher education possibilities.

The Gateway to Technology (GTT) modules provide modeling to introduce design processes, use descriptive geometry as a component of design measurement and computer modeling, help students acquire knowledge and skills in engineering problem solving and explore requirements for careers in engineering. The module on energy provides real-world learning opportunities. During the module students determine the impact that energy has on the environment. Corel draw and CAD skills are learned in the GTT classes. The program that is used is the same one used at The Ohio State University. Additionally, PLTW courses will extend the GTT concepts into the high school curriculum.

All students at designated grade levels will participate in the STEM activities. Students will demonstrate the 5 E's of scientific inquiry: engage, explore, explain, extend and evaluate. The EiE units, GTT modules and the PLTW classes are beyond the core curriculum. Students taking courses beyond the core are better prepared for college.

The programs implemented will support 21<sup>st</sup> century skills. Creativity, critical thinking, problem solving, collaboration, project-based learning, analysis of information, testing of alternatives, and the development of independent thinkers are examples of 21<sup>st</sup> century skills. Real-world learning opportunities will also be provided.

Teacher training for EiE units, GTT modules and PLTW courses augments the teacher's capacity to deliver quality instruction of STEM in an inquiry based environment. The training incorporates an approach that involves students in the same team problem-solving activities used in college and industry. Best practices will be shared during professional development.

**The Ohio Revised Content Standards in English Language Arts, Math, Science and Social Studies emphasize the skills needed to be "College and Career Ready". The MAD for STEM program will enhance each student's skills in the following areas.**

- Experience with problem solving and inquiry-based activities will help students read and comprehend complex literary and informational texts independently and proficiently.
- Students will use technology to interact and collaborate with others. They will draw evidence from literary and informational texts to support analysis, reflection, and research.
- Learners will prepare for and participate in a range of conversations and collaborations, build on others' ideas and express their own ideas clearly and persuasively.
- Information and support evidence will be presented such that listeners will follow the presenter's line of reasoning.
- Students will use digital media and visual displays to express information and enhance understanding.
- Throughout project based learning opportunities students will apply known strategies to solve new problems.
- Students will learn the importance of being precise.
- Learners will use logic to justify their conclusions and communicate to others.
- Students will persevere in solving problems. Progress will be evaluated and changes will be made if necessary. They will determine the reasonableness of their results.
- The "Eye of Integration" in the 2010 Ohio Revised Content Standards calls for an Interdisciplinary Experience. The EiE units and GTT modules will produce those Interdisciplinary Experiences.

Again, the students that participate in the **MAD for STEM** activities will develop the following universal skills: communication, problem solving, collaboration, critical thinking, research, inquiry and application. These are the skills that students are expected to demonstrate as they progress from elementary to middle school to high school to be "College and Career Ready."

9. Identify a timeline to achieve a successful implementation.

**MAD for STEM** shares OSLN's philosophy to develop new and creative ways to engage students, to create, build and invent so that this generation of students are poised to solve the worlds' challenges, contribute to our state and country's future productivity, and thrive in the global economy. **MAD for STEM** creates opportunities for all students to build a solid foundation of STEM skills and gain an awareness of related careers. Goals and outcomes identified elsewhere in the grant narrative will be achieved by the implementation of the various activities listed below. Timelines are detailed by semester for the first year, and then by school year for the remaining years of the grant cycle.

**MAD for STEM** consortium goals are:

1. All students will be able to enter a college-level course in the areas of Science, Technology, Engineering, and Math without the need for remediation.
2. All students will attack complex problems, collaboratively develop innovative solutions, communicate effectively, and apply practical applications through instruction that is inquiry-based and aligned to Ohio Revised Content Standards.
3. All students will be prepared to compete locally, nationally, and globally.
4. All students will look beyond their current reality and see educational and career possibilities.

**Partnering School Districts** (Numbering references activities below):

1. Mississinawa Valley Local
2. Ansonia Local
3. New Knoxville Local
4. New Bremen Local
5. Fort Recovery Local
6. Auglaize County Educational Service Center
7. Mercer County Educational Service Center
8. Tri Star Career Compact



**10.** Why should your LEA/school be awarded an Innovative Programs grant?

Across the country manufacturers are facing a critical gap in science, technology, engineering, and mathematics expertise. The same is true in West Central Ohio. Our local counties have a high-functioning, committed STEM Advisory Board established with expert business partners sharing resources of time and knowledge. The **MAD for STEM** program will provide our students opportunities to explore and provide solutions for meeting the needs to compete globally. Our goal is to expand the already successful STEM programs of Fort Recovery and New Bremen to Ansonia, Mississinawa Valley, and New Knoxville thus, creating a solid foundation for more students to become innovators and inventors, self-reliant and logical thinkers, and technologically literate problem solvers. Additionally, students will gain an acute awareness of the ever-challenging engineering/technical world. Every student will not choose to become an engineer, but students can become a pioneer of their own learning through rich STEM experience and be college and career ready.

Our consortium, newly organized to apply for this STEM Innovative Program grant, is committed to the implementation, continuation, and sustainability of our **MAD for STEM** program. We have the capacity to serve as an exemplar model for STEM education in Ohio. We recognize that it is no longer enough to be an *Excellent* school. Instead, it is the skills of STEM that schools must provide if students are to be prepared for their futures in this 21<sup>st</sup> century. National, state, and local statistics show an increased need for our students to become highly skilled in critical thinking, problem solving, teamwork, engineering and technology.

The consortium is made up of schools that have established a culture to sustain innovative programs (refer to Question Two). This grant offers a great opportunity for rural districts, with limited resources, to collaborate with training and professional development. The STEM districts of New Bremen and Fort Recovery will act as facilitators and mentors in the initial process of establishing STEM programs in new districts and serve as a rural STEM model for the state. Concurrently, we will expand current STEM initiatives, partially with on-line opportunities, to include global language and cultural activities, more Advanced Placement classes and expanded math, science, and technology class offerings. We form a strong nucleus of significant capacity to develop and lead STEM education efforts in Mercer, Auglaize, Darke counties and beyond.

The **MAD for STEM** consortium recognizes that STEM initiatives reach beyond our physical buildings, and it is our responsibility to insure that innovative practices occur. **MAD for STEM** utilizes a transdisciplinary approach with problem and project-based instruction whose content reaches across grades and disciplines. STEM is not just limited to science and math, it is linked to the arts, language arts, and social studies across all grade levels. Our proposal weaves STEM throughout the entire curricula using art and literature as a lens through which to express ideas and view society and culture. We share the Asia Society's goal to insure that every student who graduates possesses the knowledge, skills, and habits of mind necessary to succeed and contribute in the 21<sup>st</sup> century global environment.

We are committed to becoming active partners in the Ohio Stem Learning Network and to sharing our vision through a communications network. To this end, we will disseminate our STEM experiences through updating our *MAKE-it STEM* website, continue our service on the Northwest Ohio Regional STEM Advisory Board, and open our schools for others in Ohio to tour.

**MAD for STEM** provides 100% of our students the opportunity to discover career paths they are passionate about and empowers them to become self-directed learners. The funding of this innovative grant will directly impact 3,681 students and 184.7 teachers. It provides great dividends for years to come by creating models of instruction, curriculum and professional development. This will keep Ohio's citizens competitive in the workplace by fostering persistence, adaptability, confidence, self-management, collaboration, and high expectations. Together, teachers and students will become a community of learners.

## SECTION D

Please include LEA Name, IRN#, and proposed Innovation Program information at the top of this table. Include a breakdown of the annual expenditures anticipated in each budget category during each grant-year that equals the total dollar amount of the innovation program selected

Proposed Innovation:					
Budget Categories	FY2011	FY2012	FY2013	FY2014	Total
Salaries (100)		15,400	14,500	14,750	44,650
Retirement/ Fringe Benefits (200)		2,387	2,248	2,286	6,921
Purchase Services (400)		17,063	21,433	14,933	53,429
Supplies (500)		29,950	34,650	33,900	98,500
Capital Outlay (600)		35,500	6,250	4,750	46,500
Other (800)					
<b>9. Total Costs</b>		<b>100,300</b>	<b>79,081</b>	<b>70,619</b>	<b>250,000</b>

RttT Innovative Programs grant applications may be found on the Ohio Department of Education website under Race to the Top at:

<http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDetail.aspx?page=694>

Interested LEA/Schools are required to submit the requested grant information electronically to [jay.keeper@ode.state.oh.us](mailto:jay.keeper@ode.state.oh.us) no later than **Friday, April 8, 2011**.

Questions may be directed to  
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