



NATIONAL DEFENSE EDUCATION PROGRAM (NDEP)– SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS (STEM) EDUCATION

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Montgomery County Educational Service Center

SEPTEMBER 2013

Final Report

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THE DAYTON REGIONAL STEM CENTER,
200 SOUTH KEOWEE STREET, DAYTON OHIO 45402

Final Performance Report

**National Defense Education Program (NDEP) - Science, Technology, Engineering, and
Mathematics (STEM) Education**

**Shannon Cox, Executive Director of Instructional Services and Sandi Preiss, STEM Center
Coordinator
8/31/2013**

ABSTRACT

As per Department of Defense Grant and Agreement Regulations (DODGARS) 32.51 and Article 7.040 the Final Performance Report (FPR) is a comprehensive, cumulative, and substantive summary of the substantive progress and significant accomplishments of the Dayton Regional STEM Center achieved from 19 Oct 2009 to 31 May 2013.

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1.0 SCOPE

The Department of Defense (DoD) recognizes the downward trend shown by U.S. students in their knowledge of and their participation in STEM as an area of critical concern to national security. Basic science and mathematics competence, gained in grades K-12, form the foundation of an educated, capable, technical future work force for DoD. The objective of the National Defense Education Program is to support the education and encouragement of such a future workforce by establishing a DoD-wide program to invigorate the science and mathematics curriculum, to enhance teaching skills of science and mathematics teachers to deliver the curriculum and to increase the level of awareness, interest and active participation of students in STEM activities, projects, and academics. The overall strategy is to have DoD scientists and engineers partner with educational institutions to make direct connections between the curricula and scientific experimental processes. The NDEP program goal is to further strengthen the real world connection between school curriculum and the work of DoD STEM Professionals that facilitates obtaining a future workforce fully prepared in STEM fields.

The Dayton Regional STEM Center's STEM Fellowship is an intensive and collaborative program that nurtures STEM education leaders. These dedicated leaders are the driving force behind the materials and services that are provided by the STEM Center to teachers throughout the nation. The Dayton Regional STEM Center's STEM Fellows include Pre School-12th grade teachers working side-by-side with faculty and researchers from higher education, engineers, and scientists from local STEM industries and the Air Force Research Laboratory (AFRL) at Wright-Patterson Air Force Base. STEM Fellows develop, test, and refine STEM Units of instruction which are connected to STEM career pathways and skills. This experience and resulting curriculum enhance all users understanding of inquiry and scientific pedagogy.

2.0 PROGRAM OBJECTIVES

The DoD selected AFRL/XPPD, Domestic Partnering Branch, as the NDEP coordinator at Wright-Patterson AFB responsible for the NDEP program implementation in Ohio. The selection was made based on the strong series of on-going STEM programs at AFRL managed by XPPD. One of these programs is the Dayton Regional STEM Center partnership. The Center was created in 2007 via a National Governors Association competitive process to be the hub of STEM lessons design, training and support for educators in order to advance the goal of preparing all students with the skills and knowledge to participate in the high-demand STEM careers of the future. The Dayton Regional STEM Center is an unprecedented partnership that combines the strength of education professionals with the realities of industry needs, allowing students to make the connection between what they are learning and how it will be used in future careers, which is the main goal of the DoD NDEP program.

The Dayton Regional STEM Center and AFRL partnership was initiated by the NDEP funded Statement of Work; however, the relationship continued to go beyond the confines of the projects. AFRL Civilian and Military support services at teacher training events, WPAFB tours, relationships with AFIT, networking relationships with the industries who support AFRL, Air Camp, and general community awareness are all artifacts of a resulting impactful, STEM community partnership. This relationship played a fundamental role in the 100,000 students, 250 STEM Fellows, 1,000 educators, 5 states, 2 other countries and 90 plus Ohio districts benefiting from Dayton Regional STEM Center efforts and outreach.

On August 8, 2012, the Grant/Cooperative Agreement with the Dayton Regional STEM Center transferred from Mr. Rick Negron, Air Force Research Laboratory Domestic Partnering Branch (AFRL/XPPD) to Mr. Daniel Andrews, Wright-Patterson Air Force Base STEM Coordinator and Educational Outreach Office.

3.0 TECHNICAL REQUIREMENTS

The Dayton Regional STEM Center will perform, through their unique collaborative process known as STEM Fellows, the functions under this statement of work:

Note: STEM Fellows are university, industry, government and K-12 education experts working as collaborators.

3.1 STEM Lesson Development:

The Center will develop inquiry-based, hands-on STEM lessons utilizing regional workplace sectors or clusters that maps to real world work being done at the Air Force Research Laboratory in the areas of air systems, sensors, power/propulsion/energy, advance materials/manufacturing and medicine/human performance. The Center will work closely with AFRL STEM Fellows to develop inquiry-based/hands-on instructional lessons based on AFRL work in order to capture the real life connection required by the NDEP program. The Center in coordination with the AFRL NDEP coordinator will buy STEM Learning Modules or kits to complement the lessons as necessary. Once the lessons are developed, piloted and documented, the Center will work with the AFRL STEM Fellows and the AFRL NDEP coordinator to identify AFRL scientists and engineers to deliver parts of the lessons on site at schools in the region. As lessons are finalized, the Center will migrate them across grade levels vertically, and horizontally. As part of this task, final STEM lessons fully piloted and approved for use will be provided to the AFRL NDEP coordinator to be shared with other NDEP coordinators across the DoD.

STEM Fellows, under the leadership of the STEM Center, have developed and published 47 units of PK-12 instruction that consist of multiple lessons (average is 10 lessons) and one course in Modeling and Simulation for the High School level. These user-friendly, content-rich lessons for hands-on learning are aligned to Ohio's Academic Content Standards and are mapped to real work being done in the region's STEM industry career fields: Power and Propulsion (10 units); Advanced Materials and Manufacturing (23 units); Medicine/Human Performance (11 units); Air Vehicles (5 units); Sensors (8 units); and Modeling and Simulation (1 high school semester course).

SEE APPENDIX A

STEM Fellows collaborate with AFRL scientists and engineers to create and teach these lessons. This project provides an excellent opportunity for Dayton-area schools to tap into the combined resources of Wright-Patterson Air Force Base and the STEM Center. STEM Fellows follow a STEM Lesson Template that has been designed by the STEM Center to ensure each lesson has the right framework and content for a comprehensive curriculum that reflects the STEM Education Quality Framework (also created by the DRSC). Once vetted, lessons are accessible online and are easy to implement in the classroom.

Through collaboration with the National Defense Education Program, the STEM Center is distributing lessons nationwide to school districts in communities with Air Force bases.

Over 40 Curriculum kits reflecting DRSC curriculum and technology needs have been used in a lending library format through the STEM Fellows network. On average this network is active with over 20 Ohio school districts annually.

Additionally, materials necessary for curriculum piloting are provided to each piloting teacher to ensure authentic incorporation of curriculum into diverse classroom settings. In July 2012, thirteen school districts participated in a reallocation program of STEM materials that allowed for placement of consumables and technology directly within the district setting thereby affording staff immediate access to materials often integral to STEM educational learning experiences

3.2 Professional Development:

The Center in cooperation with AFRL and higher educational institutions in the region will develop a professional development training experience in STEM in order to build teacher and leadership capacity. Teachers, principals, and superintendents participating in the STEM Center training will be exposed to intensive engineering experiences at the AFRL facilities. The engineering

intensive experiences content will be coordinated by the Center with AFRL personnel to match the content of the STEM lessons developed for the students.

The STEM Center's fellows, higher education representatives and industry representatives interact in a collaborative team capacity. Each team is comprised of PK-12 teacher(s), industry specialist(s) and higher educational institution representative(s). Higher education institutions involved were The University of Dayton, Wright State University, Central State, Antioch University, Air Force Institute of Technology (AFIT) and Sinclair Community College. Industry specialists participated from the areas of materials, manufacturing, architecture, machining, aerospace, and the WPAFB directorates. The Fellowship program is an example of sustained professional development and also meets the standard of Highly Qualified Professional Development set by the Ohio Department of Education's Teacher Standards Board. Over 250 STEM Fellows have participated in the Fellowship program.

Figure 1

Year	PK-12 Teachers	Higher Ed	STEM Industry Volunteers	WPAFB S&E Volunteers
2010-2011	67	10	3	32
2011-2012	34	8	8	16
2012-2013	40	9	5	19

In 2010-2011 school year an approximated 2769* students participated in STEM Center curriculum via the curriculum piloting requirements for STEM Fellows. These STEM education learning experiences traditionally constituted for 500 minutes of instructional time.

In 2011-2012 school year an approximated 1176* students participated in STEM Center curriculum via the curriculum piloting requirements for STEM Fellows. These STEM education learning experiences traditionally constituted for 500 minutes of instructional time.

In 2012-2013 school year an approximated 2167* students participated in STEM Center curriculum via the curriculum piloting requirements for STEM Fellows. These STEM education learning experiences traditionally constituted for 500 minutes of instructional time.

* Due to shared distribution among STEM Fellow participants and colleagues as well as public distribution this number only reflects students participating in the teacher's pilot requirements and greatly underrepresents the

number of actual students that participate in STEM learning experiences reflecting Dayton Regional STEM Center trainings and curriculum distribution.

The Fellowship experience enabled the PK-12 teachers to serve their own districts in various leadership capacities including:

- STEM Fellows created/planned/provided professional development and support for teachers in their schools/districts.
- STEM Fellows created/planned/provided professional development and support for teachers in the region.
- STEM Fellows have designed and implemented middle and high school STEM courses for ALL students using the STEM Center curriculum and STEM Quality Framework.
- STEM Fellows created programs (after school clubs, brown bag lunch program, guest speakers, etc.) that invite STEM community participation to increase partnership and develop STEM awareness and understanding.
- STEM Fellows used the STEM Center lessons to enhance classroom connections to service learning that benefits their schools and communities.
- STEM Fellows helped obtain grants to enhance curricular and co-curricular activities for their schools and districts.
- STEM Fellows have created other innovative and custom tailored programs to increase student performance in STEM.
- STEM Fellows support regional STEM educational outreach efforts such as Junior Science and Humanities Symposium and Dayton Science Festival.

3.2.1 STEM Teacher Intern Program

The Center and AFRL/XPPD will collaborate to implement a STEM Teacher Intern Program in which area High School teachers are competitively selected to complete a four week paid internship in AFRL. The Center will coordinate the teacher selections and will make arrangements to provide the teachers the necessary stipends. AFRL/XPPD will be responsible for identifying AFRL mentors and projects for the teachers to complete during their internship. The Center will apply their STEM Lesson development process to provide assistance to the teachers and mentors in the development of a STEM Lesson based on their internship experience. The Center will provide training to teachers and AFRL mentors on STEM Lesson development and the utilization of the STEM Quality Rubric. The final lessons will be made available to AFRL for distribution across DoD.

The STEM Center and AFRL collaborated to implement a STEM Teacher Intern Program for high school teachers. Application and competitive selection process for both seasons was completed by the Center in advance of introductory training for the interns. Each teacher completed a four-week paid internship with AFRL and other STEM Industry partners. A total of 20 high school teachers participated in the experience. Each Intern was responsible for creating a unit of instruction aligned to their industry intern experience. Lessons were developed by each teacher for personal implementation. The STEM Quality Framework was used to build the lessons. STEM Interns were trained by the Center in inquiry processes, problem-based learning and the STEM Education Quality Framework.

SEE APPENDIX B

SEE APPENDIX C

3.2.2 ASM Materials Camp for High School Teachers

The STEM Center will enhance the ASM Material Camp program curriculum in the Dayton Region by providing the advanced materials/manufacturing cluster developed lessons to the ASM Material Camp. The Center will establish a cadre of teachers fully trained in ASM Materials Camp activities. The trained teachers will in turn execute the ASM Material Camp in the Dayton Region and apply engineering techniques in the classroom.

The Center accepted a proposal submitted by the ASM Materials Education Foundation to support ASM Materials Camp implementation. The camp was held 25 June-29 June, 2012 at Stebbins High School in Riverside, OH. The Center provided \$11,875.00 to ASM Materials Education Foundation, Charles Hayes to conduct the Camp.

SEE APPENDIX D

3.2.3 Modeling and Simulation

The STEM Center in collaboration with AFRL will continue improving the Modeling and Simulation course selection offered in Ohio High Schools. The Center will coordinate M&S lesson improvements and the establishment of the course in four new schools. AFRL will provide M&S scientist and engineers, as part of the STEM Fellows program, to provide the required technical expertise to the Center.

2010-2013 STEM Fellows and community advocates representing education, industry and government supported the creation, training, piloting, editing and completion of a semester long High School curriculum for Modeling and Simulation: Survey Course. Eleven high schools participated in the pilot for the 2012-2013 school year, which included 191 students. The final edited version will be available from the Center free of charge. The course will be advertised on the Center's website.

SEE APPENDIX E

SEE APPENDIX F

SEE APPENDIX G

2012-Current STEM Fellows and community advocates representing education, industry and government supported the creation of an additional semester long High School curriculum for Modeling and Simulation: Surveillance and Response. The Center will continue its implementation of the additional course through training, piloting, and editing.

3.2.4 STEM-ulate

The STEM Center will conduct two STEM-ulate workshops in the Dayton Region. The Center will assemble Professional Development Kits to Fellow facilitators for workshop sessions.

Dayton Regional STEM Fellow Teachers supported Wright Patterson's Education Outreach Middle School Teacher Workshop by providing training reflecting Dayton Regional STEM Center curriculum, the STEM Education Quality Framework and Academic Content Standards. The Wright Patterson's Education Outreach office maintained record of participant numbers. The STEM Center conducted two STEM-ulate full-day workshops in the Dayton Region in the summer of 2011 and two more in the summer of

2012. Sixteen kits were designed and used as part of the training led by a STEM Fellow in coordination with AFRL.

SEE APPENDIX G

3.2.5 STEM Workshops

The STEM Center will conduct a minimum of two STEM focused professional development teacher training activities in conjunction with AFRL conferences. The Center, in coordination with the AFRL NDEP Coordinator, will determine the location and date of the activities.

The STEM Center conducted two focused professional development training sessions in conjunction with AFRL events. TTITP was held in Tucson, AZ. At TTITP the Center provided introductory STEM Education and curriculum training to Tucson Unified School District for over 50 teachers/administrators. I/ITSEC Conference, held in Orlando, Florida, provided a forum for STEM Education outreach and roll out of the M&S Curriculum. Both conferences were held in the 2012-2013 school year.

4.0 DELIVERABLES

The STEM Center will provide quarterly and annual reports to AFRL/XPPD including the number of lessons developed/number of lessons downloaded from the website and their status. Additionally the report will include number of AFRL scientists and engineers participating in the Center activities; hours of teacher professional development training; hours of direct classroom instruction to students; list of national and local level partnerships; number of S&Es, students and teachers participants organized by Elementary/Middle/High School; demographics – including gender/race or ethnicity/disadvantaged/disability; efforts to achieve diverse and inclusive participation among teachers and students; evaluation metrics – teacher improvement or performance in STEM education instruction/program participation satisfaction/student performance, reached through the Center's activities. One copy of the STEM lessons finalized in each quarter should be attached to the quarterly report. A quarterly financial report showing dollars received and expenses will be provided by the Center to AFRL/XPPD.

The STEM Center and AFRL/XPPD will coordinate the development of a program quad chart and a program bubble chart to be provided to the DoD NDEP program manager. The charts will be updated as necessary.

In October 2010 the Dayton Regional STEM Center debuted the DaytonRegionalSTEMCenter.org website. The website offers users access to LabTV, STEM career videos, STEM Education Quality Framework and Curriculum developed by the Dayton Regional STEM Center. In October 2012, Vectren Corporation gifted the Dayton Regional

STEM Center with an updated website via the web development services of ThinkTV. The upgrade allows for improved usability as well as increased data storage and dissemination as well as offering individual pages for teachers, students, and the community. Over the past three years the Dayton Regional STEM Center's combined sites have experienced over 17,500 web visits. Since the launch of the new website the DRSC has experienced over 5,800 web visits.

SEE APPENDIX I

SEE APPENDIX J

See Figure 1.in Section 3.2 regarding number of participating AFRL scientists and engineers in the Center's activities.

The STEM Center's two pronged professional development model consist of the STEM Fellowship Program previously discussed throughout Section 3.0. The second prong of the model exists in the form of community outreach.

SEE APPENDIX M

The Center has established a dynamically growing network of partnerships.

SEE APPENDIX K

SEE APPENDIX L

Most professional development opportunities catered to the full spectrum of educators PK-12; however, focused opportunities were available throughout the duration of the cooperative agreement to support students, parents, community members, scientists, engineers and professors.

SEE APPENDIX M

Dayton Regional STEM Center outreach efforts and Fellows impact the community at large through an approximated annual effect of providing over 5,000 students STEM outreach experiences, 700 educators' professional outreach and workshop experiences and 1,500 community members STEM awareness experiences. The outreach efforts were in urban, rural and suburban Ohio school districts, various states and provided various types of STEM training. Specifically the Ohio school districts served through these efforts collectively are comprised of students who fit the subgroup classification used in the Ohio Department of Education reporting system: students with disability, English language learners, economically disadvantage, male, female, and various ethnicity groups representative of Ohio population.

DRSC was evaluated by Wright State University. Classroom observations and the analysis of teacher planning artifacts confirmed changes in the behavior of teachers participating in DRSC

professional development. Analysis of student gain scores were also positive for many of the STEM units of instruction developed through the STEM Fellows Program.

Dayton Regional STEM Center lessons can be found via the website under the teacher tab at: DaytonRegionalSTEMCenter.org.

Quarterly financial reports documented dollars received and expenses.

SEE APPENDIX N

Quad charts and bubble chart was provided to Contract Supervisor upon request throughout duration of the contract.

SEE APPENDIX K

5.0 OPERATING PROCEDURES

AFRL/XPPD will provide program management and direction to the STEM Center in the execution of the NDEP program. The STEM Center director will be responsible for execution of the NDEP funded program per the tasks described in this SOW. Activities involving AFRL STEM Fellows will be coordinated with AFRL/XPPD prior to conducting the activity. AFRL/XPPD will continue to be a non-voting member of the STEM Center Advisory Board.

Rick Negron was the non-voting member to the STEM Center Advisory Board and when it was transferred to the WPAFB Educational Outreach Office, Daniel Andrews replaced Rick Negron on the STEM Center Advisory Board. The respective Contract Officer Representative (COR) served on the STEM Center Advisory Board for the duration of the cooperative agreement. Prior to conducting activities, the STEM Center Director and the COR would communicate via bi-weekly teleconference, face-to-face meetings, and email communication. Also, yearly "Kick-Off" meetings were used prior the Center's Fellowship Program. The Center's Advisory Board convened semi-annually.

Personnel assigned will receive OPSEC Awareness Education and Duty related training deemed necessary by the Government or program supported. OPSEC Awareness Education and Training will be provided or coordinated through government channels and OPSEC protective measures (countermeasures) will be applied as directed by government or program sponsors.

No employees from the Dayton Regional STEM Center were on-base contractors so OPSEC Training was not needed. Normal Awareness was encouraged by making sure that the off-site contractors (non-base contractors-Dayton Regional STEM Center Employees) would clear information for public release with the Contract Officer Representative (COR).

7.0 TECHNICAL and FINANCIAL REPORTING

7.1 The recipient shall engage in all program review meetings to provide progress reports and discuss technical issues.

7.1.1 These meetings are anticipated to be semi-annual including a kick-off meeting shortly after agreement signatures.

7.1.2 The recipient will be required to actively engage with and share work information with Government reviewers including electronic copies of presentations.

The Center Executive Director participated in program review meetings, provided progress reports, discussed technical issues, and shared work information surpassing minimum anticipation as outlined in the scope of work.

APPENDICIES

APPENDIX A

Screen shot from website data base displaying name of STEM career connection (name, first column) and number of STEM Curriculum linked to the career field (last column).

The screenshot shows the WordPress admin interface for the 'Industry' taxonomy. On the left is the 'Add New Category' form, and on the right is a table listing existing categories and their associated curriculum counts.

Add New Category Form:

- Name:** (Text input field)
- Slug:** (Text input field)
- Parent:** (Dropdown menu, currently set to 'None')
- Description:** (Text area)
- Buttons:** 'Add New Category' and 'Screen Options'.

Category List Table:

Name	Description	Slug	Stem Curriculum
Advanced Manufacturing and Materials		advanced-manufacturing-materials	23
Agricultural Engineering		agricultural-engineering	2
Air Systems/Vehicles		air-systemsvehicles	5
Environmental Engineering		environmental-engineering	4
Human Performance and Medicine		human-performance-medicine	11
Industry Cluster		industry-cluster	0
Power and Propulsion		power-propulsion	10
Sensors		sensors	8

APPENDIX B

STEM Teacher Interns table. Including season, participant coding, Ohio School District, field(s) of study and Organization in which the internship took place.

Year	Participant	District	Internship Fields of Study	Lead Organization
2011	BR11	Jefferson Township	Math, Science and Engineering	AFRL
2011	DB11	Tipp City	Math, Science and Engineering	Wright State University
2011	MC11	Dayton Public Schools	Math, Science and Engineering	AFRL
2012	JC12	Yellow Springs High/McKinney Middle	Mechanical Engineering, CAD Design, Technology, Robotics Computer Science	AFRL: Tec^Edge
2012	JCL12	Stebbins High School	Mechanical Engineering, CAD Design, Technology, Robotics Computer Science	AFRL: Tec^Edge
2011	SC11	Dayton Public Schools	Math, Science and Engineering	AFRL: Tec^Edge
2012	RD12	Greenville High School	Chemistry, Physics, Engineering, Materials	AFRL/RXBT
2012	CD12	Valley View High School	Mathematics, Technology, Science	AFRL: Tec^Edge
2012	TG12	Memorial High School	Science, Physics, Aeronautics, Airplane Design	Wright State University
2012	AH12	DECA High School	Sensor Physics, Technology	AFRL: Tec^Edge
2011	FH11	Upper Valley Career Technical Center	Physics, Fluid Dynamics, Aerodynamics, Chemistry and Engineering	Spectral Energies
2012	AH12	Fairborn High School	Mathematics, Technology, Science	AFRL: Tec^Edge

2011	KJ11	Mad River	Mathematics	AFRL
2012	BL12	Piqua High School	Mathematics, Technology, Science	AFRL: Tec^Edge
2012	DL12	Fairmont High School	Chemistry, Physics, Engineering, Materials	AFRL/RXBT
2011	KP11	Tri-Village	Mathematics, Technology, Science	AFRL: Tec^Edge
2011	AR11	Oakwood	Mathematics, Technology, Science	AFRL: Tec^Edge
2012	DS12	Xenia High School	Mathematics, Physics, Engineering	AFRL
2012	ES12	Russia High School	Physics, fluid dynamics, chemistry, engineering	Spectral Energies, LLC

Appendix C

STEM Learning Quality Component	Not Evident	Emerging	Accomplished	Advanced
1. Potential for Engaging Students of Diverse Academic Backgrounds <i>Quality STEM learning experiences are designed to engage the minds and imaginations of students of diverse academic backgrounds.</i>	The learning experience has little or no potential for student engagement given the prior knowledge and/or skill level of the targeted class.	The learning experience has potential for engaging <i>some</i> of the students in the targeted class given their prior knowledge and experience. For example, the task may be appropriate for some students, while being too challenging, or not challenging enough for others.	The learning experience has potential for engaging <i>most</i> of the students in an academically homogenous class, or is differentiated to meet the needs of <i>sub-groups</i> of diverse learners in the targeted class.	The learning experience, in addition to being appropriately leveled or differentiated to provide students with the opportunity for academic success, is designed to <i>challenge the minds and stimulate the imaginations</i> of learners with diverse histories of academic success.
2. Degree of STEM Integration <i>Quality STEM learning experiences are carefully designed to help students integrate knowledge and skills from Science, Technology, Engineering and Mathematics.</i>	The learning experience provides no opportunities for students to consider the relationships between and among Science, Technology, Engineering or Mathematics.	The learning experience requires students to complete task(s) that integrate knowledge and/or skills <i>from two of the STEM disciplines</i> . Or, the teacher describes or prompts discussion of the relationships between and among two or more of the STEM Disciplines.	The learning experience requires students to complete task(s) that integrate knowledge and/or skills from <i>three of the STEM disciplines</i> . For example, students use a graphing calculator to apply a mathematics formula to a science data set.	The learning experience is carefully designed to help students integrate knowledge and skills from Science, Technology, Engineering and Mathematics. For example, science students design and test water filtration devices, calculate their comparative efficiencies, and display the data using computer software.
3. Connections to Non-STEM Disciplines <i>Quality STEM learning experiences help students connect STEM knowledge and skills with academic standards from other disciplines.</i>	The learning experience provides no opportunities for students to make connections between their STEM learning and non-STEM disciplines. For example, Language Arts, Social Studies, Art, etc.).	The learning experience <i>overtly identifies a connection between the STEM and non-STEM disciplines</i> but does not require students to perform tasks that integrate those disciplines.	The learning experience requires students to <i>integrate their STEM learning with knowledge and/or skills from at least one non-STEM discipline</i> . For example, researching the economic and environmental impacts of alternative energy sources.	The learning experience requires students to connect STEM learning with one or more non-STEM disciplines, and <i>includes instructional support for quality performance</i> in the non-STEM discipline. For example, providing students with information about quality technical writing.

STEM Learning Quality Component	Not Evident	Emerging	Accomplished	Advanced
4. Integrity of the Academic Content <i>Quality STEM learning experiences are content-accurate, anchored to the relevant content standards, and focused on the big ideas and foundational skills critical to future learning in the targeted discipline(s).</i>	The academic content for the learning experience is inaccurate or is not anchored to the relevant academic content standards.	The academic content for the learning experience is accurately presented and appropriately anchored to <i>at least one academic content standard</i> for each content area represented.	The academic content for the learning experience is accurately portrayed and appropriately anchored to <i>more than one academic content standard</i> for each content area represented. Or, the learning experiences is anchored to one content standard in each targeted discipline that is <i>difficult to teach, or hard to learn</i> .	The academic content for the learning experience is accurately portrayed, tied to multiple content standards, and <i>focused on helping students acquire deep understanding of a “big idea” or “foundational skill” critical to their future learning</i> in the targeted discipline(s).
5. Quality of the Cognitive Task <i>Quality STEM learning experiences challenge students to develop higher order thinking skills through processes such as inquiry, problem-solving, and creative thinking.</i>	The cognitive task is simplistic, too easily solved, and does not require students to employ higher-order thinking skills.	The cognitive task requires students to employ higher order thinking skills in addressing a project or problem with the <i>procedures prescribed by the teacher</i> .	The cognitive task requires students to employ higher order thinking skills in addressing a teacher-defined project or problem where <i>students are responsible for designing the procedures</i> to complete the assigned task(s).	The cognitive task requires students to select and employ the higher-order thinking skills necessary to <i>frame the problem, design the procedures, develop strategies to complete the project, or to generate one or more possible solutions to the problem</i> . (For example, in PBL this is frequently referred to as presenting students with an <i>ill-structured</i> problem).
6. Connections to STEM Careers <i>Quality STEM learning experiences place students in learning environments that help them to better understand and personally consider STEM careers.</i>	The learning experience provides no opportunity for students to explore STEM careers that are related to the STEM learning experience taking place in the classroom.	The learning experience <i>engages students in work that occurs in one or more STEM careers</i> , but does not explicitly help students make the connection between their classroom work and work in the STEM career field.	The learning experience engages students in work that occurs in one or more STEM careers <i>and the teacher intentionally helps students see the relationship between their classroom work and the work carried out by STEM professionals</i> .	The learning experience requires students to complete tasks in a <i>simulated or real STEM work environment in which they are working like STEM professionals</i> . In addition, the experience includes an activity <i>intentionally designed to help students explore the relevant STEM careers and their educational requirements</i> .

STEM Learning Quality Component	Not Evident	Emerging	Accomplished	Advanced
7. Individual Accountability in a Collaborative Culture <i>Quality STEM learning experiences often require students to work and learn independently and in collaboration with others using effective interpersonal skills.</i>	Students are not required to work or learn in collaboration with other students.	Students are encouraged or required to work in teams, but the collaborative work is <i>informal in nature with little or no attention given to individual accountability.</i>	Students are required to work in <i>formally structured teams with specific methods for measuring team and individual accountability</i> for the targeted learning outcomes.	Students are required to work in formally structured teams that have clearly defined expectations for individual and team accountability, <i>including an intentional instructional focus on helping students develop the interpersonal skills</i> valued in real-world work environments such as respect for diverse perspectives, active listening, checking for shared understanding, etc.
8. Nature of Assessment(s) <i>Quality STEM learning experiences require students to demonstrate knowledge and skill, in part, through performance-based tasks.</i>	The assessment plan is limited in scope and designed to <i>test primarily for retention using traditional measures</i> such as pencil and paper tests and quizzes.	The assessment plan includes more than one form of assessment, with at least one assessment that <i>requires students to demonstrate knowledge or skill</i> through the completion of a performance-based task.	The assessment plan includes multiple forms of assessment with at least one assessment that is performance-based and <i>anchored to a rubric</i> . The assessment however, is not an authentic representation of the real world of work outside of school.	The assessment plans includes one or more rubric-based, performance assessments that require students to demonstrate knowledge and/or skill in completing <i>authentic</i> tasks that model performances in the real world of work outside of school.

STEM Learning Quality Component	Not Evident	Emerging	Accomplished	Advanced
9. Application of the Engineering Design Process <i>Quality STEM learning experiences require students to demonstrate knowledge and skills fundamental to the engineering design process (e.g., brainstorming, researching, creating, testing, improving, etc.).</i>	The learning experience includes no requirement that students develop thinking skills required in the engineering design process.	The learning experience helps students develop or refine thinking skills that are <i>part of the engineering design process</i> without explicitly referencing the engineering design process.	The learning experience <i>explicitly references the engineering design process</i> and requires students to demonstrate thinking skills across <i>multiple steps in the engineering design process</i> .	The learning experience, in addition to explicitly referencing engineering design, requires students to demonstrate thinking skills in employing all steps in the engineering design process <i>including opportunities to experience the recursive nature of the process</i> .
10. Quality of Technology Integration <i>Quality STEM learning experiences provide students with hands-on experience in using multiple technologies. (Examples: computer hardware and software, calculators, probes, scales, microscopes, rulers and hand lenses to name just a few)</i>	The learning experience includes no opportunities for technology integration and makes no references to the many roles technology plays in the STEM fields.	The learning experience includes one or more technology tools or resources which are <i>employed or demonstrated only by the teacher</i> .	The learning experience <i>engages students in effectively employing at least one technology tool or resource selected by the teacher</i> .	The learning experience <i>requires students to select and effectively employ multiple technology tools and resources to enhance their capacity to complete tasks, solve problems or manage projects</i> .

Appendix D

Send All Invoices To MONTGOMERY COUNTY EDUCATIONAL SERVICE CENTER- TREASURER 200 SOUTH KEOWEE STREET DAYTON, OH 45402 937-225-4603 EXT. 3027		PURCHASE ORDER		<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Purchase Order No.</td> </tr> <tr> <td style="text-align: center;">06/15/2012</td> <td style="text-align: center;">1203359</td> </tr> <tr> <td colspan="2" style="text-align: center;">Page</td> </tr> <tr> <td colspan="2" style="text-align: center;">001</td> </tr> </table>		Date	Purchase Order No.	06/15/2012	1203359	Page		001													
Date	Purchase Order No.																								
06/15/2012	1203359																								
Page																									
001																									
I S S U E D T O		015132 FAX: ASM MATERIALS EDUCATION FOUND CHARLES R HAYES, EXECUTIVE DIR 9639 KINSMAN ROAD MATERIALS PARK OH		S H I P T O ATTN: TERMS: REQUISITION NO. OP120681																					
IMPORTANT *ALL SHIPPING DOCUMENTS, INVOICES AND CORRESPONDENCE MUST REFER TO P.O. NO. ALL SHIPPING CHARGES MUST BE PREPAID WE CANNOT ACCEPT C.O.D. SHIPMENTS. TERMS OF CONDITIONS: TIME OF DELIVERY IS OF ESSENCE OF THIS CONTRACT. BUYER RESERVES THE RIGHT TO REFUSE ANY GOODS AND TO CANCEL ALL OR ANY PART OF THIS ORDER IF SELLER FAILS TO DELIVER ALL OR ANY PART OF THE GOODS IN ACCORDANCE WITH THE TERMS OF THIS ORDER.																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">QUANTITY</th> <th style="width: 10%;">UNIT</th> <th style="width: 40%;">DESCRIPTION</th> <th style="width: 15%;">UNIT PRICE</th> <th style="width: 25%;">AMOUNT</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td></td> <td> TO CONDUCT A 40 PLUS HOUR PROFESSIONAL DEVELOPMENT SEMINAR FOR DAYTON AREA STEM TEACHERS JUNE 25, 2012 THROUGH JUNE 29, 2012 FROM STEM NDEP/219/ASM MATERIALS CAMP </td> <td style="text-align: right;">11,875.00</td> <td style="text-align: right;">11,875.00</td> </tr> <tr> <td colspan="4" style="text-align: right;">PAGE TOTAL</td> <td style="text-align: right;">11,875.00</td> </tr> <tr> <td colspan="4" style="text-align: right;">GRAND TOTAL</td> <td style="text-align: right;">11,875.00</td> </tr> </tbody> </table>						QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	AMOUNT	1		TO CONDUCT A 40 PLUS HOUR PROFESSIONAL DEVELOPMENT SEMINAR FOR DAYTON AREA STEM TEACHERS JUNE 25, 2012 THROUGH JUNE 29, 2012 FROM STEM NDEP/219/ASM MATERIALS CAMP	11,875.00	11,875.00	PAGE TOTAL				11,875.00	GRAND TOTAL				11,875.00
QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	AMOUNT																					
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<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">TI</th> <th style="width: 5%;">FUND</th> <th style="width: 5%;">FUNC.</th> <th style="width: 5%;">OBJ.</th> <th style="width: 10%;">SPCC.</th> <th style="width: 10%;">SUBJ.</th> <th style="width: 5%;">OPU</th> <th style="width: 5%;">IL</th> <th style="width: 5%;">JOB</th> <th style="width: 40%;">AMOUNT</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">05</td> <td style="text-align: center;">599</td> <td style="text-align: center;">2211</td> <td style="text-align: center;">412</td> <td style="text-align: center;">9124</td> <td style="text-align: center;">000000</td> <td style="text-align: center;">000</td> <td style="text-align: center;">00</td> <td style="text-align: center;">000</td> <td style="text-align: right;">11,875.00</td> </tr> </tbody> </table>						TI	FUND	FUNC.	OBJ.	SPCC.	SUBJ.	OPU	IL	JOB	AMOUNT	05	599	2211	412	9124	000000	000	00	000	11,875.00
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05	599	2211	412	9124	000000	000	00	000	11,875.00																
IT IS HEREBY CERTIFIED THAT THE AMOUNT REQUIRED TO MEET THE CONTRACT, AGREEMENT, OBLIGATION, PAYMENT OR EXPENDITURE FOR THE ABOVE, HAS BEEN LAWFULLY APPROPRIATED OR AUTHORIZED OR DIRECTED FOR SUCH PURPOSE AND IS IN THE TREASURY OR IN PROCESS OF COLLECTION TO THE CREDIT OF THE FUNDS OF THE BOARD OF EDUCATION FREE FROM ANY OBLIGATION OR CERTIFICATION NOW OUTSTANDING.																									
School Districts Are Exempt From Federal Excise Taxes And Ohio Sales Tax. TAX EXEMPT																									
STATE ID: 31-0895399 FED ID: 31-0895399																									
THIS ORDER IS VOID UNLESS TREASURER'S CERTIFICATE IS SIGNED																									
 TREASURER ORIGINATOR'S COPY																									

Appendix E

Content Progression

This course is meant to serve as an introduction to the Modeling and Simulation discipline which has diverse applications from training to prototyping. Industry professionals using Modeling and Simulation range from medical responders attempting to improve their response capabilities, manufacturing companies interested in improving quality of production rates or parts, NASCAR's performance interest in designing more aerodynamic vehicles, to aerospace engineers designing new satellites or space systems.

Modeling and Simulation is becoming an increasingly common industry standard as it lessens risks and costs while promoting collaboration and creative problem-solving. The expectation is that course participants will develop a working knowledge of the discipline, mathematical and scientific content as well as 21st century skills such as collaboration, problem-solving, creativity, and technological competency.

Main concepts of Modeling and Simulation include an understanding and application of types of simulation: live, virtual, and constructive, as well as types of modeling: physical, mathematical and process models. Students will also explore computer programming through introductory challenges where they develop a basic source code necessary for the capstone project. It is essential that students routinely employ the Engineering Design Process as they systematically navigate the curricular concepts.

As students work through the learning sequence, they will navigate and address many of the challenges common to this career field including software validation, software verification, and level of fidelity. Validation is the process of determining to what degree a model or simulation represents data, objects, projects or relationships. Verification is the process of determining whether a model or simulation aligns with the developer's theoretical description and specifications. Fidelity refers to the degree the modeled simulation or scenario reflects its true form. Students will spend much time determining the appropriate level of fidelity for the capstone project. This will require students to balance hardware capabilities, allotted time and simulation goals.

Conceptual growth of the individual learner will be monitored throughout the six modules. Student generation of a concept map will occur in Modules One, Five and Six. Additionally, each module relies on student completion of journal entries reflecting the enduring understandings, essential questions, and objectives. These entries will further support a culminating paper submission.

The following chart outlines the content progression of the six modules. Supplied information is also located in the Content Overview section within each module.

Appendix F

Module	Content Overview
Module 1	Module One of this survey course provides an overview and introduction to the field of Modeling and Simulation. Students will be introduced to the discipline, and will complete a concept map to serve as a baseline for measured growth at the end of the semester. Next, students will investigate the types of models and simulations and their potential application in industry. After reviewing course objectives and expectations, students will utilize Microsoft Excel to develop mathematical models of a simple situation. Using their knowledge of the use of Excel, students will interpret data gathered from a physical model of a trebuchet. As a summative assessment, students will validate trebuchet simulation software from VirtualTrebuchet.com, based on the results from the physical model.
Module 2	In Module Two, students will continue the exploration of modeling tools, and will begin conducting research relative to the development of simulations. First, students will explore node theory through an operations research task. They will evaluate process models in a systematic manner and make decisions regarding real-world scenarios. Next, students will investigate the stride length and average walking rate of students in the class. They will utilize Microsoft Excel's capabilities to interpret data and make conclusions. Finally, students will apply their understanding of node theory to the development of an evacuation network blueprint.
Module 3	In Module Three, students will explore 3-D modeling as a component of the field of Modeling and Simulation. Students will utilize SolidWorks modeling software to generate 3-D renderings of common classroom objects. A didactic video tutorial is provided to guide students through the process of rendering a filing cabinet. Following this experience, students will model a classroom object of their choosing, applying the SolidWorks techniques they have learned. Students will apply measuring techniques such as the use of a caliper when generating their high fidelity 3-D models. Finally, students will articulate the need for varied fidelity modeling in application in different real-world scenarios.
Module 4	In Module Four, students will investigate programming as a component of the field of Modeling and Simulation. First, students will investigate Scratch, a programming software with pre-programmed tiles that can be pieced together to accomplish tasks in a virtual environment. Next, students will read and complete activities from a Python programming text, <i>Invent Your Own Computer Games with Python</i> . In these activities, students will learn the commands and syntax of programming specific to Python. Following this introduction, students will write a program that represents the Fibonacci sequence as a mathematical model. Students will develop this program in its entirety, and will then apply their understanding of source code to the analysis of their stride rate data from Module Two. Students will modify an existing Python program to allow it to read their CSV file and make conclusions about the evacuation scenario. Finally, students will generate a program that simulates the exponential growth of fire in the evacuation network. They will apply their understanding of exponential functions and Python programming to verify the program as a constructive simulation.

Module 5	In Module Five, students are formally introduced to the capstone project and the Valve software that will be utilized for its completion. Using tutorial resources, students will generate a sample virtual map with the various functions of the Half-Life 2's, Hammer Editor. Through guided practice with the software features, students will develop the skills necessary for completion of the course capstone project. Additionally students will reflect upon their conceptual understanding of Modeling and Simulation by making additions to their previously generated concept map. A midterm take home exam that reflects the course enduring understandings is also provided as a summative assessment.
Module 6	Module Six encompasses an entire school quarter (45 school days) of classroom time and is entirely devoted to the course capstone project. Students will develop a virtual environment that resembles the evacuation network blueprint identified in Module Two, and apply acquired course concepts to the creation of a school evacuation simulation. Students will incorporate their knowledge of 3-D modeling, computer programming, and serious game level development as they apply the Engineering Design Process to their capstone project. They will consider facets of Modeling and Simulation such as fidelity, validity, and verifiability at each stage of development, and will make informed decisions about their project. Upon completion of simulation development, students will compose a summative verification study that evaluates their capstone project.

Appendix G

Modeling and Simulation: Survey Course pilot sites table: including participating Ohio High Schools, participating years, and notation on hardware/software provisions.

Ohio High School's Curriculum Incorporation	School Year	Hardware/Software Provided through Dayton Regional STEM Center
Tri Village	2011-2012 2012-2013	X
Piqua	2012-2013	
New Lebanon	2012-2013	
Northridge	2012-2013	
Northmont	2012-2013	X
Dayton Regional STEM School	2011-2012 2012-2013	X
Valley View	2012-2013	X
Brookville	2012-2013	X
Fairborn	2012-2013	X
Stebbins	2012-2013	
Dayton Early College Academy	2012-2013	

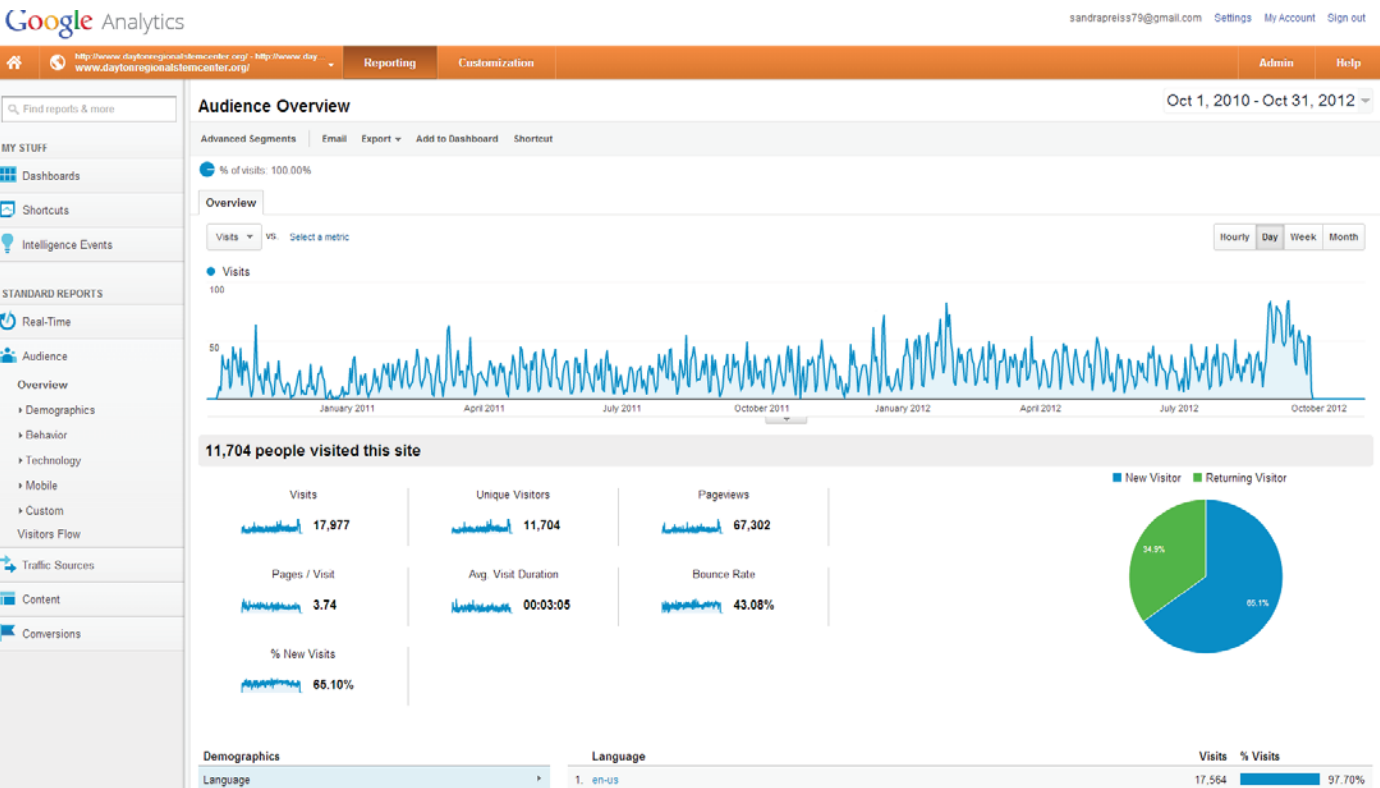
Appendix H

Below is a table of STEM-ulate workshop sessions facilitated by Dayton Regional STEM Center Fellows. Workshop date and accompanying curriculum and kit information are provided below for the four events.

Workshop Date	Curriculum/Kit
June 22, 2011	Compressed Air Vehicle
June 22, 2011	It's Not Rocket Science
June 22, 2011	Thermal Insulators
June 22, 2011	Nature of Flight
August 9, 2011	Compressed Air Vehicle
August 9, 2011	It's Not Rocket Science
August 9, 2011	Thermal Insulators
August 9, 2011	Nature of Flight
July 19, 2013	Compressed Air Vehicle
July 19, 2013	Launch Into Energy Transformations
July 19, 2013	Thermal Insulators
July 19, 2013	Nature of Flight
July 26, 2013	Compressed Air Vehicle
July 26, 2013	Launch Into Energy Transformations
July 26, 2013	Thermal Insulators
July 26, 2013	Nature of Flight

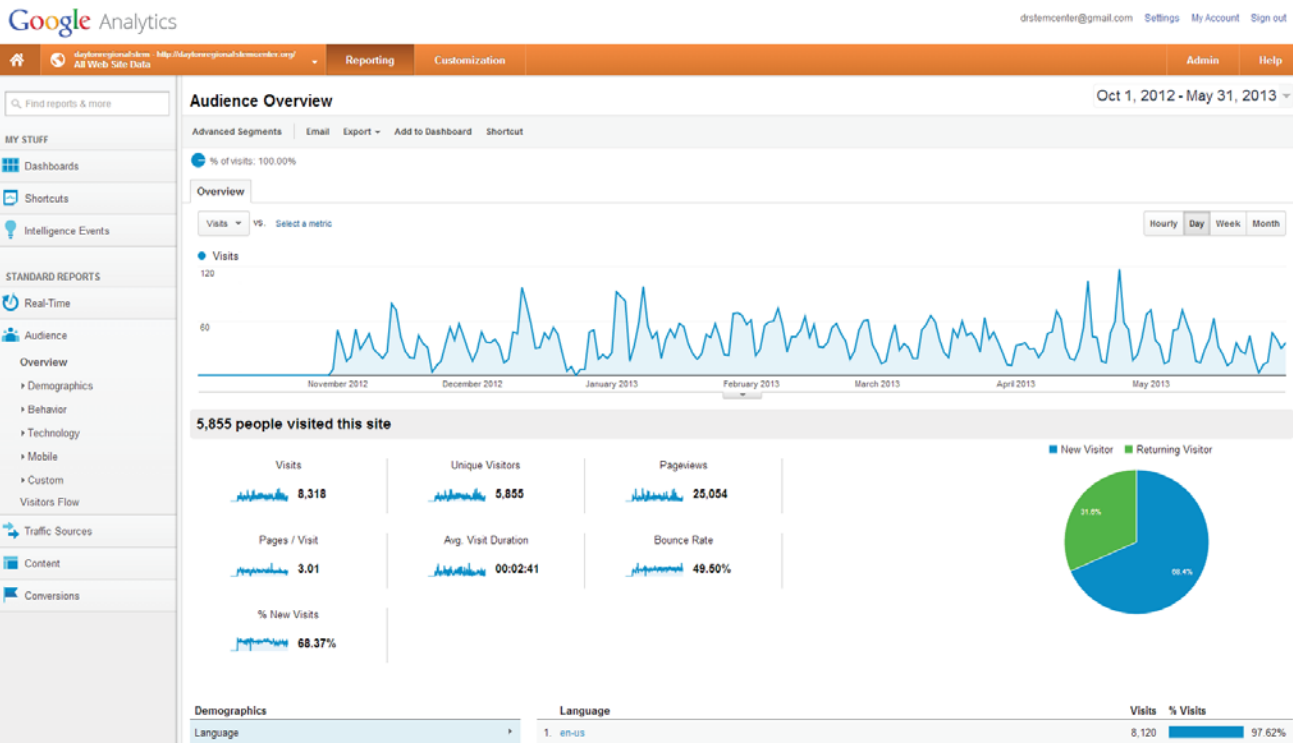
Appendix I

Google Analytics Dashboard view for the Dayton Regional STEM Center website usage for the initial website launched October 2010 and closed October 2012.



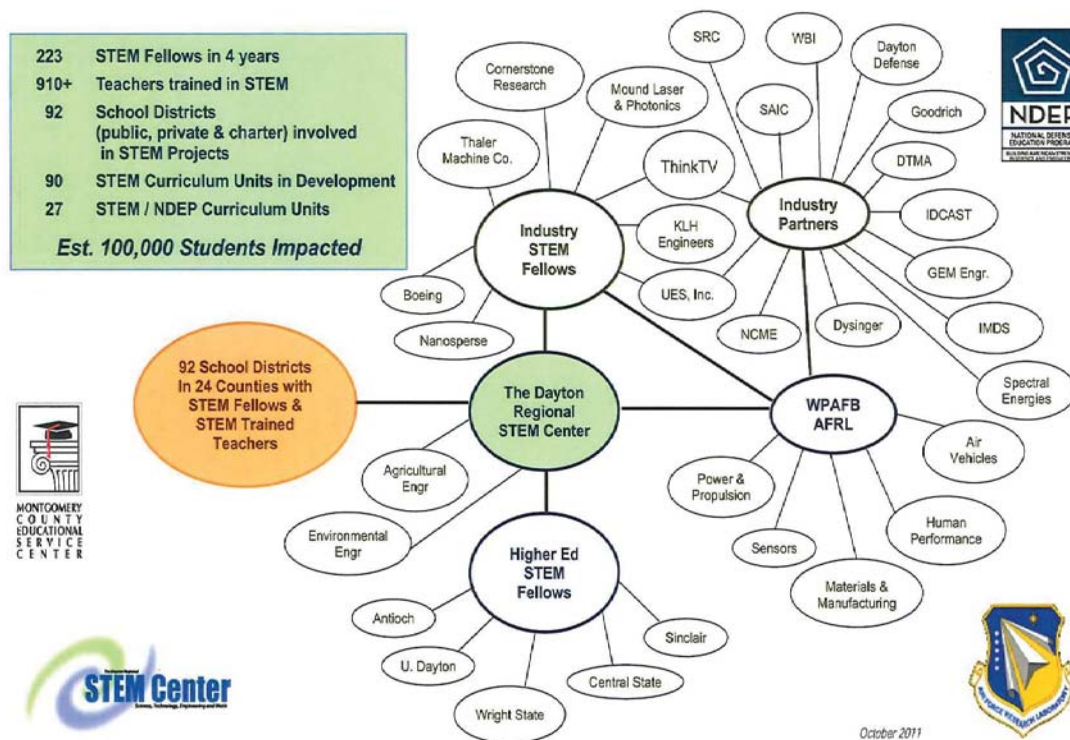
Appendix J

Google Analytics Dashboard view for the Dayton Regional STEM Center website usage for second website launched October 2012.



Appendix K

Below is a bubble chart displaying Dayton Regional STEM Center 2011-2012 active partnerships.



Appendix L

PowerPoint chart displaying Dayton Regional STEM Center 2012-2013 active partnerships.



Appendix M

Below is a catalog of STEM Center events.

Date	Approximate Duration	Dayton Regional STEM Center's Role	Organization/ Event	Location	Participants
Mar-Apr 2013	90 minutes	Workshop session	NSTA Conference	Indianapolis, IN	K-12 Educators
Feb 2012	3 (1 hour sessions)	Workshop sessions	SECO	Dayton, OH	K-12 Educators
Feb 2013	3 (1 hour sessions)	Workshop session	TechFest Conference	Dayton, OH	Middle School Educators Students
Feb 2013		Interactive Booth	TechFest Conference	Dayton, OH	K-12 Educators Students
2012-2013		Consultation	Nation of Kosovo	Dayton, OH	Educational Administrators
August 2012- May 2013	5 (7 hour sessions)	Workshop session	Dayton Regional STEM Center Fellow's Program	Dayton, OH	PK-12 Educators Industry Government Higher Ed
2012		Consultation	Maryland	Maryland	Educational Administrators Government
Dec 2012		Briefing	I/ITSEC	Orlando, FL	K-12 Educators Educational Administrators Industry Government

Nov 2012	3 hours	Workshop session	TTITP	Tucson, AZ	K-12 Educators District Administrators
Nov 2012	3 (75 minute sessions)	Workshop session	Boonshoft Museum	Dayton, OH	K-6 Educators
Sept 2012	3 hours	Workshop session	Dayton Regional STEM Center	Dayton, OH	Higher Ed
2012		Consultation Training	Washington Alliance for Better Schools	Dayton, OH	Educational Administrators
Jun-Aug 2012	160 hours	Internships	AFRL and Dayton STEM Industry	Dayton, OH	High School Educators
July 2012	2 (1hour sessions)	Workshop session	STEM Think Tank Conference	Nashville, TN	K-12 Educators
June 2012	4.5 (6 hour sessions)	Workshop session	Modeling and Simulation	Dayton, OH	High School Educators
June 2012	8 (1 hour sessions)	Workshop session	STEM-ulate	Dayton, OH	Middle School Educators
May 2012	6 hours	Workshop session	Dayton Regional STEM Center Internships and Modeling and Simulation Training	Dayton, OH	K-12 Educators
April 2012		Briefing	P12 EDERS	Washington, DC	Higher Ed Government
March 2012		Briefing	ASEE Conference	Ada, OH	Higher Ed
Feb 2012	16 hours	Interactive Booth	TechFest	Dayton, OH	K-12 Educators

					K-12 Students
Jan 2012		Strategic Planning	Dayton Public Schools: Thurgood Marshall	Dayton, OH	District Administrators High School Educators
August 2011- June 2012	32 hours	Workshop session	Dayton Regional STEM Center Fellow's Program	Dayton, OH	K-12 Educators Industry Government Higher Ed
2011-2012		Consultation	Northwest Pennsylvania Virtual STEM	Dayton, OH	Educational Administrators
Dec 2011		Ambassadors	I/ITSEC	Orlando, FL	Government Industry
Nov 2011	1 hour	Informational Session	Ohio Legislative Breakfast	Dayton, OH	Government Industry
Nov 2011	6 hours	Workshop	Elementary STEM Workshop	Dayton, OH	Elementary Educators
Nov 2011	6 hours	Workshop	Middle School STEM Workshop	Dayton, OH	Middle School Educators
Nov 2011	6 hours	Workshop	High School STEM Workshop	Dayton, OH	High School Educators
Oct 2011	6 (75 minute sessions)	Workshop session	Boonshoft Museum	Dayton, OH	K-12 Educators
Oct 2011	90 minutes	Informational Session	Russian Education Visit	Dayton, OH	Higher Ed

					Government
Oct 2011	3 (1 hour sessions)	Workshop session	Waverly High School, Ohio	Waverly, OH	K-12 Educators District Administrators
Oct 2011	7 hours	Workshop	National Museum of the United States Air Force	Dayton, OH	PK-K Educators
Summer 2011	8 (60 minute sessions)	Workshop session	STEM-ulate	Dayton, OH	Middle School Educators
Jun-Aug 2011	160 hours	Internships	AFRL and Dayton STEM Industry	Dayton, OH	K-12 Educators
Jun 2011	6 hours	Workshop	Dayton Regional STEM Center	Dayton, OH	PK-K Educators
Apr 2011	6 hours	Workshop session	Ohio University	Athens, OH	K-12 Educators
Mar 2011	6 hours	Workshop	National Museum of the United States Air Force	Dayton, OH	PK-K Educators
Feb 2011	1 hour	Workshop session	TechFest	Dayton, OH	K-12 Educators
Feb 2011	16 hours	Interactive Booth	TechFest	Dayton, OH	K-12 Educators K-12 Students
Feb 2011	7 ours	Workshop session	National Museum of the United States Air Force	Dayton, OH	PK-K Educators
August 2010-	32 hours	Workshop	Dayton Regional	Dayton, OH	K-12 Educators

June 2011		sessions	STEM Center Fellow's Program		Industry Government Higher Ed
Dec 2010	1 hour	Workshop session	Wright State University	Dayton, OH	K-12 Educators Students

Appendix N

FEDERAL FINANCIAL REPORT

(Follow form instructions)

1. Federal Agency and Organizational Element to Which Report is Submitted USAF/AFMC DET 1 AF RESEARCH LABORATORY 2310 EIGHTH STREET, BUILDING 167 WRIGHT-PATTERSON AFB OH 45433-7801						2. Federal Grant or Other Identifying Number Assigned by Federal Agency (To report multiple grants, use FFR Attachment) FA8650-10-2-1743						Page of 1 pages	
3. Recipient Organization (Name and complete address including Zip code) Montgomery County Educational Service Center 200 S. Keowee Street, Dayton, OH 45402													
4a. DUNS Number 039745591			4b. EIN 31-0895399		5. Recipient Account Number or Identifying Number (To report multiple grants, use FFR Attachment) Cage Code 5LCA9				6. Report Type ☐ Quarterly ☐ Semi-Annual ☒ Annual ☐ Final			7. Basis of Accounting ☒ Cash ☐ Accrual	
8. Project/Grant Period (Month, Day, Year) From: October 19, 2009 To: September 30, 2012								9. Reporting Period End Date (Month, Day, Year) September 30, 2010					
10. Transactions										Cumulative			
(Use lines a-c for single or multiple grant reporting)													
Federal Cash (To report multiple grants, also use FFR Attachment):													
a. Cash Receipts										166,468.53			
b. Cash Disbursements										231,556.00			
c. Cash on Hand (line a minus b)										(65,087.47)			
(Use lines d-o for single grant reporting)													
Federal Expenditures and Unobligated Balance:													
d. Total Federal funds authorized										247,600.00			
e. Federal share of expenditures										231,556.00			
f. Federal share of unliquidated obligations													
g. Total Federal share (sum of lines e and f)										231,556.00			
h. Unobligated balance of Federal funds (line d minus g)										16,044.00			
Recipient Share:													
i. Total recipient share required													
j. Recipient share of expenditures													
k. Remaining recipient share to be provided (line i minus j)													
Program Income:													
l. Total Federal program income earned													
m. Program income expended in accordance with the deduction alternative													
n. Program income expended in accordance with the addition alternative													
o. Unexpended program income (line l minus line m or line n)													
11. Indirect Expense		a. Type	b. Rate	c. Period From	d. Base	e. Amount Charged	f. Federal Share						
					g. Totals:	0	0	0					
12. Remarks: Attach any explanations deemed necessary or information required by Federal sponsoring agency in compliance with governing legislation:													
13. Certification: By signing this report, I certify to the best of my knowledge and belief that the report is true, complete, and accurate, and the expenditures, disbursements and cash receipts are for the purposes and intent set forth in the award documents. I am aware that any false, fictitious, or fraudulent information may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 18, Section 1001)													
a. Typed or Printed Name and Title of Authorized Certifying Official Joni M. Shoemaker, Treasurer							c. Telephone (Area code, number, and extension) (937) 225-4600 ext. 3029						
							d. Email Address mg_treas@mdeca.org						
b. Signature of Authorized Certifying Official 							e. Date Report Submitted (Month, Day, Year) 10/29/10						
							14. Agency use only:						

Standard Form 425 - Revised 6/28/2010

OMB Approval Number: 0348-0061

Expiration Date: 10/31/2011

Paperwork Burden Statement

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB Control Number. The valid OMB control number for this information collection is 0348-0061. Public reporting burden for this collection of information is estimated to average 1.5 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0061), Washington, DC 20503.

FEDERAL FINANCIAL REPORT

(Follow form instructions)

1. Federal Agency and Organizational Element to Which Report is Submitted USAF/AFMC DET 1 AF RESEARCH LABORATORY 2310 EIGHTH STREET, BUILDING 167 WRIGHT-PATTERSON AFB OH 45433-7801		2. Federal Grant or Other Identifying Number Assigned by Federal Agency (To report multiple grants, use FFR Attachment) FA8650-10-2-1743		Page of 1 pages		
3. Recipient Organization (Name and complete address including Zip code) Montgomery County Educational Service Center 200 S. Keowee Street, Dayton, OH 45402						
4a. DUNS Number 039745591	4b. EIN 31-0895399	5. Recipient Account Number or Identifying Number (To report multiple grants, use FFR Attachment) Cage Code 5LCA9		6. Report Type ☒ Quarterly ☐ Semi-Annual ☐ Annual ☐ Final	7. Basis of Accounting ☒ Cash ☐ Accrual	
8. Project/Grant Period (Month, Day, Year) From: October 19, 2009 To: September 30, 2012		9. Reporting Period End Date (Month, Day, Year) December 31, 2010				
10. Transactions (Use lines a-c for single or multiple grant reporting)					Cumulative	
Federal Cash (To report multiple grants, also use FFR Attachment):						
a. Cash Receipts					242,266.29	
b. Cash Disbursements					305,349.71	
c. Cash on Hand (line a minus b)					(63,083.42)	
(Use lines d-o for single grant reporting)						
Federal Expenditures and Unobligated Balance:						
d. Total Federal funds authorized					487,600.00	
e. Federal share of expenditures					305,349.71	
f. Federal share of unliquidated obligations						
g. Total Federal share (sum of lines e and f)					305,349.71	
h. Unobligated balance of Federal funds (line d minus g)					182,250.29	
Recipient Share:						
i. Total recipient share required						
j. Recipient share of expenditures						
k. Remaining recipient share to be provided (line i minus j)						
Program Income:						
l. Total Federal program income earned						
m. Program income expended in accordance with the deduction alternative						
n. Program income expended in accordance with the addition alternative						
o. Unexpended program income (line l minus line m or line n)						
11.	a. Type	b. Rate	c. Period From	d. Base	e. Amount Charged	f. Federal Share
Indirect Expense						
g. Totals:				0	0	0
12. Remarks: Attach any explanations deemed necessary or information required by Federal sponsoring agency in compliance with governing legislation:						
13. Certification: By signing this report, I certify to the best of my knowledge and belief that the report is true, complete, and accurate, and the expenditures, disbursements and cash receipts are for the purposes and intent set forth in the award documents. I am aware that any false, fictitious, or fraudulent information may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 18, Section 1001)						
a. Typed or Printed Name and Title of Authorized Certifying Official Joni M. Shoemaker, Treasurer				c. Telephone (Area code, number, and extension) (937) 225-4600 ext. 3029		
				d. Email Address mg_treas@mdeca.org		
b. Signature of Authorized Certifying Official 				e. Date Report Submitted (Month, Day, Year) 12/29/10		
14. Agency use only:						

Standard Form 425 - Revised 6/28/2010
OMB Approval Number: 0348-0061
Expiration Date: 10/31/2011

Paperwork Burden Statement

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB Control Number. The valid OMB control number for this information collection is 0348-0061. Public reporting burden for this collection of information is estimated to average 1.5 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0061), Washington, DC 20503.

FEDERAL FINANCIAL REPORT

(Follow form instructions)

1. Federal Agency and Organizational Element to Which Report is Submitted USAF/AFMC DET 1 AF RESEARCH LABORATORY 2310 EIGHTH STREET, BUILDING 167 WRIGHT-PATTERSON AFB OH 45433-7801		2. Federal Grant or Other Identifying Number Assigned by Federal Agency (To report multiple grants, use FFR Attachment) FA8650-10-2-1743		Page of 1 pages		
3. Recipient Organization (Name and complete address including Zip code) Montgomery County Educational Service Center 200 S. Keowee Street, Dayton, OH 45402						
4a. DUNS Number 039745591	4b. EIN 31-0895399	5. Recipient Account Number or Identifying Number (To report multiple grants, use FFR Attachment) Cage Code 5LCA9	6. Report Type ☒ Quarterly ☐ Semi-Annual ☐ Annual ☐ Final	7. Basis of Accounting ☒ Cash ☐ Accrual		
8. Project/Grant Period (Month, Day, Year) From: October 19, 2009 To: September 30, 2012			9. Reporting Period End Date (Month, Day, Year) June 30, 2011			
10. Transactions (Use lines a-c for single or multiple grant reporting)			Cumulative			
Federal Cash (To report multiple grants, also use FFR Attachment):						
a. Cash Receipts			372,471.51			
b. Cash Disbursements			468,961.91			
c. Cash on Hand (line a minus b)			(96,490.40)			
(Use lines d-o for single grant reporting)						
Federal Expenditures and Unobligated Balance:						
d. Total Federal funds authorized			562,600.00			
e. Federal share of expenditures			468,961.91			
f. Federal share of unliquidated obligations						
g. Total Federal share (sum of lines e and f)			468,961.91			
h. Unobligated balance of Federal funds (line d minus g)			93,638.09			
Recipient Share:						
i. Total recipient share required						
j. Recipient share of expenditures						
k. Remaining recipient share to be provided (line i minus j)						
Program Income:						
l. Total Federal program income earned						
m. Program income expended in accordance with the deduction alternative						
n. Program income expended in accordance with the addition alternative						
o. Unexpended program income (line l minus line m or line n)						
11. Indirect Expense	a. Type	b. Rate	c. Period From	d. Base	e. Amount Charged	f. Federal Share
g. Totals:			0	0	0	
12. Remarks: Attach any explanations deemed necessary or information required by Federal sponsoring agency in compliance with governing legislation:						
13. Certification: By signing this report, I certify to the best of my knowledge and belief that the report is true, complete, and accurate, and the expenditures, disbursements and cash receipts are for the purposes and intent set forth in the award documents. I am aware that any false, fictitious, or fraudulent information may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 18, Section 1001)						
a. Typed or Printed Name and Title of Authorized Certifying Official Joni M. Shoemaker, Treasurer				c. Telephone (Area code, number, and extension) (937) 225-4600 ext. 3029		
				d. Email Address mg_treas@mdeca.org		
b. Signature of Authorized Certifying Official 				e. Date Report Submitted (Month, Day, Year) 11/11		
				14. Agency use only:		

Standard Form 425 - Revised 6/28/2010
OMB Approval Number: 0348-0061
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(Follow form instructions)

Paperwork Burden Statement
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1. Federal Agency and Organizational Element to Which Report is Submitted USAF/AFMC DET 1 AF RESEARCH LABORATORY 2310 EIGHTH STREET, BUILDING 167 WRIGHT-PATTERSON AFB OH 45433-7801		2. Federal Grant or Other Identifying Number Assigned by Federal Agency (To report multiple grants, use FFR Attachment) FA8650-10-2-1743		Page of 1 pages			
3. Recipient Organization (Name and complete address including Zip code) Montgomery County Educational Service Center 200 S. Keowee Street, Dayton, OH 45402							
4a. DUNS Number 039745591	4b. EIN 31-0895399	5. Recipient Account Number or Identifying Number (To report multiple grants, use FFR Attachment) Cage Code 5LCA9	6. Report Type ☒ Quarterly ☐ Semi-Annual ☐ Annual ☐ Final	7. Basis of Accounting ☒ Cash ☐ Accrual			
8. Project/Grant Period (Month, Day, Year) From: October 19, 2009 To: September 30, 2012			9. Reporting Period End Date (Month, Day, Year) March 31, 2011				
10. Transactions (Use lines a-c for single or multiple grant reporting)			Cumulative				
Federal Cash (To report multiple grants, also use FFR Attachment):							
a. Cash Receipts			319,231.00				
b. Cash Disbursements			347,034.85				
c. Cash on Hand (line a minus b)			(27,803.85)				
(Use lines d-o for single grant reporting)							
Federal Expenditures and Unobligated Balance:							
d. Total Federal funds authorized			487,600.00				
e. Federal share of expenditures			347,034.85				
f. Federal share of unliquidated obligations							
g. Total Federal share (sum of lines e and f)			347,034.85				
h. Unobligated balance of Federal funds (line d minus g)			140,565.15				
Recipient Share:							
i. Total recipient share required							
j. Recipient share of expenditures							
k. Remaining recipient share to be provided (line i minus j)							
Program Income:							
l. Total Federal program income earned							
m. Program income expended in accordance with the deduction alternative							
n. Program income expended in accordance with the addition alternative							
o. Unexpended program income (line l minus line m or line n)							
11. Indirect Expense	a. Type	b. Rate	c. Period From	Period To	d. Base	e. Amount Charged	f. Federal Share
			g. Totals:	0	0	0	
12. Remarks: Attach any explanations deemed necessary or information required by Federal sponsoring agency in compliance with governing legislation:							
13. Certification: By signing this report, I certify to the best of my knowledge and belief that the report is true, complete, and accurate, and the expenditures, disbursements and cash receipts are for the purposes and intent set forth in the award documents. I am aware that any false, fictitious, or fraudulent information may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 18, Section 1001)							
a. Typed or Printed Name and Title of Authorized Certifying Official Joni M. Shoemaker, Treasurer				c. Telephone (Area code, number, and extension) (937) 225-4600 ext. 3029			
				d. Email Address mg_treas@mdeca.org			
b. Signature of Authorized Certifying Official 				e. Date Report Submitted (Month, Day, Year) 3/31/11			
				14. Agency use only:			

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FEDERAL FINANCIAL REPORT

(Follow form instructions)

1. Federal Agency and Organizational Element to Which Report is Submitted USAF/AFMC DET 1 AF RESEARCH LABORATORY 2310 EIGHTH STREET, BUILDING 167 WRIGHT-PATTERSON AFB OH 45433-7801		2. Federal Grant or Other Identifying Number Assigned by Federal Agency (To report multiple grants, use FFR Attachment) FA8650-10-2-1743		Page 1 of 1 pages		
3. Recipient Organization (Name and complete address including Zip code) Montgomery County Educational Service Center 200 S. Keowee Street, Dayton, OH 45402						
4a. DUNS Number 039745591	4b. EIN 31-0895399	5. Recipient Account Number or Identifying Number (To report multiple grants, use FFR Attachment) Cage Code 5LCA9		6. Report Type ☒ Quarterly ☐ Semi-Annual ☐ Annual ☐ Final	7. Basis of Accounting ☒ Cash ☐ Accrual	
8. Project/Grant Period (Month, Day, Year) From: October 19, 2009 To: September 30, 2012			9. Reporting Period End Date (Month, Day, Year) March 31, 2012			
10. Transactions (Use lines a-c for single or multiple grant reporting)				Cumulative		
Federal Cash (To report multiple grants, also use FFR Attachment):						
a. Cash Receipts				622,992.72		
b. Cash Disbursements				669,701.35		
c. Cash on Hand (line a minus b)				(46,708.63)		
Federal Expenditures and Unobligated Balance:						
d. Total Federal funds authorized				797,600.00		
e. Federal share of expenditures				669,701.35		
f. Federal share of unliquidated obligations						
g. Total Federal share (sum of lines e and f)				669,701.35		
h. Unobligated balance of Federal funds (line d minus g)				127,898.65		
Recipient Share:						
i. Total recipient share required						
j. Recipient share of expenditures						
k. Remaining recipient share to be provided (line i minus j)						
Program Income:						
l. Total Federal program income earned						
m. Program income expended in accordance with the deduction alternative						
n. Program income expended in accordance with the addition alternative						
o. Unexpended program income (line l minus line m or line n)						
11. Indirect Expense	a. Type	b. Rate	c. Period From	d. Base	e. Amount Charged	f. Federal Share
g. Totals:				0	0	0
12. Remarks: Attach any explanations deemed necessary or information required by Federal sponsoring agency in compliance with governing legislation:						
13. Certification: By signing this report, I certify to the best of my knowledge and belief that the report is true, complete, and accurate, and the expenditures, disbursements and cash receipts are for the purposes and intent set forth in the award documents. I am aware that any false, fictitious, or fraudulent information may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 18, Section 1001)						
a. Typed or Printed Name and Title of Authorized Certifying Official Joni M. Shoemaker, Treasurer				c. Telephone (Area code, number, and extension) (937) 225-4600 ext. 3029		
				d. Email Address mg_treas@mdeca.org		
b. Signature of Authorized Certifying Official 				e. Date Report Submitted (Month, Day, Year) 4/2/12		
14. Agency use only:						

Standard Form 425 - Revised 6/28/2010
OMB Approval Number: 0348-0061
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Paperwork Burden Statement

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FEDERAL FINANCIAL REPORT

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1. Federal Agency and Organizational Element to Which Report is Submitted USAF/AFMC DET 1 AF RESEARCH LABORATORY 2310 EIGHTH STREET, BUILDING 167 WRIGHT-PATTERSON AFB OH 45433-7801		2. Federal Grant or Other Identifying Number Assigned by Federal Agency (To report multiple grants, use FFR Attachment) FA8650-10-2-1743		Page of 1 pages			
3. Recipient Organization (Name and complete address including Zip code) Montgomery County Educational Service Center 200 S. Keowee Street, Dayton, OH 45402							
4a. DUNS Number 039745591	4b. EIN 31-0895399	5. Recipient Account Number or Identifying Number (To report multiple grants, use FFR Attachment) Cage Code 5LCA9		6. Report Type ☒ Quarterly ☐ Semi-Annual ☐ Annual ☐ Final	7. Basis of Accounting ☒ Cash ☐ Accrual		
8. Project/Grant Period (Month, Day, Year) From: October 19, 2009 To: May 31, 2013		9. Reporting Period End Date (Month, Day, Year) June 30, 2012					
10. Transactions					Cumulative		
(Use lines a-c for single or multiple grant reporting)							
Federal Cash (To report multiple grants, also use FFR Attachment):							
a. Cash Receipts					690,683.89		
b. Cash Disbursements					721,341.60		
c. Cash on Hand (line a minus b)					(30,657.71)		
(Use lines d-o for single grant reporting)							
Federal Expenditures and Unobligated Balance:							
d. Total Federal funds authorized					1,104,475.00		
e. Federal share of expenditures					721,341.60		
f. Federal share of unliquidated obligations							
g. Total Federal share (sum of lines e and f)					721,341.60		
h. Unobligated balance of Federal funds (line d minus g)					383,133.40		
Recipient Share:							
i. Total recipient share required							
j. Recipient share of expenditures							
k. Remaining recipient share to be provided (line i minus j)							
Program Income:							
l. Total Federal program income earned							
m. Program income expended in accordance with the deduction alternative							
n. Program income expended in accordance with the addition alternative							
o. Unexpended program income (line l minus line m or line n)							
11.	a. Type	b. Rate	c. Period From	Period To	d. Base	e. Amount Charged	f. Federal Share
Indirect Expense							
g. Totals:					0	0	0
12. Remarks: Attach any explanations deemed necessary or information required by Federal sponsoring agency in compliance with governing legislation:							
13. Certification: By signing this report, I certify to the best of my knowledge and belief that the report is true, complete, and accurate, and the expenditures, disbursements and cash receipts are for the purposes and intent set forth in the award documents. I am aware that any false, fictitious, or fraudulent information may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 18, Section 1001)							
a. Typed or Printed Name and Title of Authorized Certifying Official Joni M. Shoemaker, Treasurer					c. Telephone (Area code, number, and extension) (937) 225-4600 ext. 3029		
b. Signature of Authorized Certifying Official 					d. Email Address mg_treas@mdeca.org		
					e. Date Report Submitted (Month, Day, Year) 7/2/12		
14. Agency use only:							

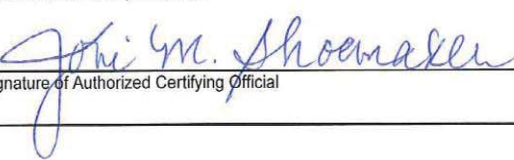
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FEDERAL FINANCIAL REPORT

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3. Recipient Organization (Name and complete address including Zip code) Montgomery County Educational Service Center 200 S. Keowee Street, Dayton, OH 45402						
4a. DUNS Number 039745591	4b. EIN 31-0895399	5. Recipient Account Number or Identifying Number (To report multiple grants, use FFR Attachment) Cage Code 5LCA9	6. Report Type ☒ Quarterly ☐ Semi-Annual ☐ Annual ☐ Final	7. Basis of Accounting ☒ Cash ☐ Accrual		
8. Project/Grant Period (Month, Day, Year) From: October 19, 2009 To: May 31, 2013			9. Reporting Period End Date (Month, Day, Year) September 30, 2012			
10. Transactions			Cumulative			
(Use lines a-c for single or multiple grant reporting)						
Federal Cash (To report multiple grants, also use FFR Attachment):						
a. Cash Receipts			931,432.03			
b. Cash Disbursements			956,658.68			
c. Cash on Hand (line a minus b)			(25,226.65)			
(Use lines d-o for single grant reporting)						
Federal Expenditures and Unobligated Balance:						
d. Total Federal funds authorized			1,404,475.00			
e. Federal share of expenditures			956,658.68			
f. Federal share of unliquidated obligations						
g. Total Federal share (sum of lines e and f)			956,658.68			
h. Unobligated balance of Federal funds (line d minus g)			447,816.32			
Recipient Share:						
i. Total recipient share required						
j. Recipient share of expenditures						
k. Remaining recipient share to be provided (line i minus j)						
Program Income:						
l. Total Federal program income earned						
m. Program income expended in accordance with the deduction alternative						
n. Program income expended in accordance with the addition alternative						
o. Unexpended program income (line l minus line m or line n)						
11.	a. Type	b. Rate	c. Period From	d. Base	e. Amount Charged	f. Federal Share
Indirect Expense						
			g. Totals:	0	0	0
12. Remarks: Attach any explanations deemed necessary or information required by Federal sponsoring agency in compliance with governing legislation:						
13. Certification: By signing this report, I certify to the best of my knowledge and belief that the report is true, complete, and accurate, and the expenditures, disbursements and cash receipts are for the purposes and intent set forth in the award documents. I am aware that any false, fictitious, or fraudulent information may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 18, Section 1001)						
a. Typed or Printed Name and Title of Authorized Certifying Official Joni M. Shoemaker, Treasurer				c. Telephone (Area code, number, and extension) (937) 225-4600 ext. 3029		
b. Signature of Authorized Certifying Official 				d. Email Address mg_treas@mdeca.org		
				e. Date Report Submitted (Month, Day, Year) 10/11/12		
				14. Agency use only:		

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FEDERAL FINANCIAL REPORT

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3. Recipient Organization (Name and complete address including Zip code) Montgomery County Educational Service Center 200 S. Keowee Street, Dayton, OH 45402						
4a. DUNS Number 039745591	4b. EIN 31-0895399	5. Recipient Account Number or Identifying Number (To report multiple grants, use FFR Attachment) Cage Code 5LCA9		6. Report Type ☒ Quarterly ☐ Semi-Annual ☐ Annual ☐ Final	7. Basis of Accounting ☒ Cash ☐ Accrual	
8. Project/Grant Period (Month, Day, Year) From: October 19, 2009 To: May 31, 2013		9. Reporting Period End Date (Month, Day, Year) December 31, 2012				
10. Transactions (Use lines a-c for single or multiple grant reporting)				Cumulative		
Federal Cash (To report multiple grants, also use FFR Attachment):						
a. Cash Receipts				1,037,383.67		
b. Cash Disbursements				1,051,660.61		
c. Cash on Hand (line a minus b)				(14,276.94)		
Federal Expenditures and Unobligated Balance:						
d. Total Federal funds authorized				1,404,475.00		
e. Federal share of expenditures				1,051,660.61		
f. Federal share of unliquidated obligations						
g. Total Federal share (sum of lines e and f)				1,051,660.61		
h. Unobligated balance of Federal funds (line d minus g)				352,814.39		
Recipient Share:						
i. Total recipient share required						
j. Recipient share of expenditures						
k. Remaining recipient share to be provided (line i minus j)						
Program Income:						
l. Total Federal program income earned						
m. Program income expended in accordance with the deduction alternative						
n. Program income expended in accordance with the addition alternative						
o. Unexpended program income (line l minus line m or line n)						
11. Indirect Expense	a. Type	b. Rate	c. Period From	d. Base	e. Amount Charged	f. Federal Share
g. Totals:				0	0	0
12. Remarks: Attach any explanations deemed necessary or information required by Federal sponsoring agency in compliance with governing legislation:						
13. Certification: By signing this report, I certify to the best of my knowledge and belief that the report is true, complete, and accurate, and the expenditures, disbursements and cash receipts are for the purposes and intent set forth in the award documents. I am aware that any false, fictitious, or fraudulent information may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 18, Section 1001)						
a. Typed or Printed Name and Title of Authorized Certifying Official Joni M. Shoemaker, Treasurer			c. Telephone (Area code, number, and extension) (937) 225-4600 ext. 3029			
			d. Email Address mg_treas@mdeca.org			
b. Signature of Authorized Certifying Official 			e. Date Report Submitted (Month, Day, Year) 12/28/12			
			14. Agency use only:			

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(Follow form instructions)

Paperwork Burden Statement
According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB Control Number. The valid OMB control number for this information collection is 0348-0061. Public reporting burden for this collection of information is estimated to average 1.5 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0061). Washington, DC 20503.

FEDERAL FINANCIAL REPORT

(Follow form instructions)

1. Federal Agency and Organizational Element to Which Report is Submitted USAF/AFMC DET 1 AF RESEARCH LABORATORY 2310 EIGHTH STREET, BUILDING 167 WRIGHT-PATTERSON AFB OH 45433-7801		2. Federal Grant or Other Identifying Number Assigned by Federal Agency (To report multiple grants, use FFR Attachment) FA8650-10-2-1743		Page of 1 pages			
3. Recipient Organization (Name and complete address including Zip code) Montgomery County Educational Service Center 200 S. Keowee Street, Dayton, OH 45402							
4a. DUNS Number 039745591	4b. EIN 31-0895399	5. Recipient Account Number or Identifying Number (To report multiple grants, use FFR Attachment) Cage Code 5LCA9	6. Report Type ☐ Quarterly ☐ Semi-Annual ☐ Annual ☒ Final	7. Basis of Accounting ☒ Cash ☐ Accrual			
8. Project/Grant Period (Month, Day, Year) From: October 19, 2009 To: May 31, 2013			9. Reporting Period End Date (Month, Day, Year) 07/31/2013				
10. Transactions (Use lines a-c for single or multiple grant reporting) Federal Cash (To report multiple grants, also use FFR Attachment):			Cumulative				
a. Cash Receipts		1,332,886.93					
b. Cash Disbursements		1,332,886.93					
c. Cash on Hand (line a minus b)		0.00					
(Use lines d-o for single grant reporting) Federal Expenditures and Unobligated Balance:							
d. Total Federal funds authorized		1,404,475.00					
e. Federal share of expenditures		1,332,886.93					
f. Federal share of unliquidated obligations							
g. Total Federal share (sum of lines e and f)		1,332,886.93					
h. Unobligated balance of Federal funds (line d minus g)		71,588.07					
Recipient Share:							
i. Total recipient share required							
j. Recipient share of expenditures							
k. Remaining recipient share to be provided (line i minus j)							
Program Income:							
l. Total Federal program income earned							
m. Program income expended in accordance with the deduction alternative							
n. Program income expended in accordance with the addition alternative							
o. Unexpended program income (line l minus line m or line n)							
11. Indirect Expense	a. Type	b. Rate	c. Period From	Period To	d. Base	e. Amount Charged	f. Federal Share
				g. Totals:	0	0	0
12. Remarks: Attach any explanations deemed necessary or information required by Federal sponsoring agency in compliance with governing legislation:							
13. Certification: By signing this report, I certify to the best of my knowledge and belief that the report is true, complete, and accurate, and the expenditures, disbursements and cash receipts are for the purposes and intent set forth in the award documents. I am aware that any false, fictitious, or fraudulent information may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 18, Section 1001)							
a. Typed or Printed Name and Title of Authorized Certifying Official Joni M. Shoemaker, Treasurer					c. Telephone (Area code, number, and extension) (937) 225-4600 ext. 3029		
b. Signature of Authorized Certifying Official 					d. Email Address mg_treas@mdeca.org		
e. Date Report Submitted (Month, Day, Year) 08/16/2013					14. Agency use only:		

Standard Form 425 - Revised 6/28/2010
 OMB Approval Number: 0348-0061
 Expiration Date: 10/31/2011

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Appendix O

Quad Chart



The Dayton Regional STEM Center



Description:

The STEM (Science, Technology, Engineering, & Mathematics) Center is the hub of curriculum design, training, and support for K-12 educators in order to increase student awareness and excitement about STEM and to advance the goal of preparing all students with the skills and knowledge to participate in STEM disciplines and careers should they choose to pursue them. In order for all students to have access, the STEM Center believes that high quality STEM education must be integrated into the regular school day. The way we design and disseminate our curriculum fills that need. Our motto is, "All means all."

Activities:

- ☑ Fall STEM Curriculum Dissemination at Boonshoft Museum
- ☑ STEM Fellow Meetings occur weekly to develop and create STEM / NDEP Curriculum; each group meets every two weeks
- ☑ AFRL Tour of 4 Directorates for STEM Educator Fellows
- ☑ National Air Camp – STEM Fellows & DRSC wrote the curriculum and STEM Fellows were the lead instructors
- ☑ TechFest 2010 – 2539 registered youths in attendance, 14 STEM Fellows presented 4 hands-on STEM activities
- ☑ Working with multiple districts to design STEM Courses for their districts using our STEM / NDEP Curriculum
- ☑ Plan, collaborate, and provide customized professional development of STEM Curriculum and Inquiry for Greene County, Southeast, and Northwest Ohio.
- ☑ Representation on the Dayton Regional STEM School Board.
- ☑ Partner with GameDesk to create a gaming piece for STEM / NDEP Curricula (Thermal Energy)
- ☑ Partner with Dr. James Rowley to create a framework and rubrics for quality STEM instruction.
- ☑ Partner with PBS to create a video that introduces the quality STEM framework and rubrics
- ☑ Partner with PBS to create introductory STEM videos that motivate students toward STEM disciplines
- ☑ STEM Career Video-Teleconferences



Air Camp Participants designing and constructing air foils to test in the wind tunnel.



AFRL Engineer Dr. Rita Peterson presenting a STEM / NDEP activity at TechFest 2010.



AFRL Engineer John Diaz assists in training educators on a STEM / NDEP Lesson.



AFRL Engineer Bruce Preiss co-teaches a STEM / NDEP Lesson on the Gulf oil leak.

Progress / Schedule:

- 11/02/10 – STEM / NDEP Curriculum & Inquiry Professional Development for Teachers of Grades K-12
- Nov. 2010-June 2011 – Educators and AFRL Engineers/Scientists pilot STEM / NDEP Lessons with materials kits
- 11/29/10 – STEM / NDEP Lesson presented online for 4th grade Ohio Teachers (hosted by SOITA)
- Present-June 2011 – STEM Fellow Meetings twice monthly to develop and create STEM / NDEP Curriculum

Sample Quad Chart



The Dayton Regional STEM Center

Description:

The STEM (Science, Technology, Engineering, & Mathematics) Center is the hub of curriculum design, training, and support for educators in order to increase student awareness and excitement about STEM and to advance the goal of preparing *all* students with the skills and knowledge to participate in STEM disciplines and careers should they choose to pursue them. In order for all students to have access, we believe that high quality STEM education must be integrated into the regular school day. The way we design and disseminate our curriculum fills that need. Our motto is, "All means all."

Activities:

- ☑ Fall STEM Curriculum Dissemination at Boonshoft Museum
- ☑ STEM Fellow Meetings occur twice monthly to develop and create STEM / NDEP Curriculum
- ☑ AFRL Tour of 5 Directorates for STEM Educator Fellows
- ☑ Presented 4 STEM / NDEP Curricula at the SOITA Conference
- ☑ National Air Camp – STEM Fellows & DRSC writing, piloting, and vetting the curriculum
- ☑ TechFest 2010 – 2539 registered youths in attendance
- ☑ Representation on the Governor's Committee for planning state and regional STEM awareness campaigns
- ☑ State STEM Conference in Columbus
- ☑ Regional STEM Conference in Dayton – Strengthening our STEM Connections
- ☑ Working with multiple districts to design STEM Courses for their districts using our STEM / NDEP Curriculum
- ☑ Collaborating with the Greene County Business & Education Task Force to plan professional development of STEM Curriculum.
- ☑ Representation on the State Science Standards Revision Writing Committee
- ☑ Representation on the Dayton Regional STEM School Board and their Curriculum Committee
- ☑ Presentation of STEM / NDEP Curriculum at Centerville School District for 4th & 5th Grade Teachers
- ☑ Partner with Avetec to create gaming pieces for STEM / NDEP Curricula
- ☑ Partner with PBS to create introductory STEM videos that motivate students toward STEM disciplines
- ☑ STEM Career Video-Teleconferences



The STEM Fellows serving on the Air Camp Curriculum Writing Team investigating opportunities Sinclair has to offer.



STEM Fellows working closely together; one from AFRL, one from a classroom.



TechFest 2010 with STEM Fellow from Sensors Directorate



Teachers learning the STEM Center Compressed Air Vehicle lesson and being introduced to scramjet technology

Progress / Schedule:

- 05/11, 06/14, & 06/18/10 – STEM Curriculum & Inquiry Professional Development for Teachers of Grades K-12
- 06/15-17, 06/23-25, & 08/04-08/06/10 – Engineering is Elementary Professional Development for Teachers of Grades K-5
- 06/21 & 06/22/10 – STEM Training for New STEM Fellows
- Present – June 2010 – STEM Fellow Meetings twice monthly to develop and create STEM / NDEP Curriculum
- Present – Sep 2010 – Pilot & develop kits for 20 STEM/NDEP Curriculum
- July – August 2010 – Summer Engineering Intensive Experience for STEM Fellows (Tour 4 local engineering businesses)