FY 2012 NWO Staff

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NWO Mission
The Center's mission is to advance science, technology, engineering, and mathematics (STEM) education for people of all ages.

NWO Vision
The Northwest Ohio Center of Excellence aims to advance science, technology, engineering, and mathematics (STEM) education for people of all ages. Our purpose is to work with community partners to (a) generate new knowledge about the science of teaching and learning, (b) apply this knowledge by developing the expertise of K-12 educators and higher education faculty, (c) increase public support for, and understanding of, the STEM subject areas, and (d) stimulate the interest of young people, especially those in underrepresented groups, in these rewarding fields of study and career opportunities.

Dear Friends of NWO,

NWO saw many changes this year, but the most influential was the growth of our partnership with the Ohio STEM Learning Network (OSLN), which is funded in part by the Battelle Foundation. In FY 2012 NWO was named the Northwest Ohio Hub for OSLN and charged with advancing STEM education in northwest Ohio through two main programs (1) the formation of a STEM Training Center housed at the Toledo Technology Academy and (2) working on the Literacy Design Collaborative's College Ready Tools program with Perkins Local Schools. The OSLN funding also supported many FY 2013 activities including the NWO Symposium, NWO Inquiry Series, and STEM in the Park.

In FY 2012 NWO was the lead on a large National Science Foundation: Math and Science Partnership (NSF MSP) grant. We are pleased to announce that this $7.28 million, 5-year grant was awarded in September 2012. NWO, along with BGSU, Perkins Local Schools, Sandusky City Schools, and several local community partners, will be working together to enhance grades 3-8 education across the curriculum, using citizen science as a base for promoting student mastery of the Ohio Learning Standards.

As we move forward to FY 2013 we have many things to look forward to, including several new grant projects from state and national organizations and support from foundations and businesses for our existing programs. Two new staff members will be joining the team in the new year which will bring new ideas and experiences which can only enhance the efforts of NWO. Our COSMOS Team continues to be a strong and influential group at Bowling Green State University (BGSU) and played a major role in the awarding of the NSF MSP grant and the success of many activities, most especially STEM in the Park. These two activities have also specifically enhanced our status at BGSU and brought many new people into our fold allowing us to do even more in FY 2013.

I hope this annual report gives you a glimpse into the efforts of the NWO Staff and Team and heightens your awareness of our efforts in the many areas of STEM education.

Sincerely,
W. Robert Midden, NWO Director
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## NWO Goals and Corresponding Activities

**Goal 1: Develop the expertise of pre-service and in-service teachers in STEM and STEM education disciplines.**

**NWO Activities**
- NWO Inquiry Series
- NWO Symposium on STEM Teaching (NWO Symposium)
- Undergraduate and graduate teacher preparation courses or program modification

**Affiliated Activities**
- Grant projects
- Undergraduate professional organizations (BGCTM, BGSECO, etc.)
- Community Resources Workshop
- Continued support of the MAT degree programs

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**Goal 2: Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty.**

**NWO Activities**
- Ohio Junior Science and Humanities Symposium (OJSHS)
- STEM in the Park
- Grant Projects (GRAMS, BOSEF, etc.)

**Affiliated Activities**
- Grant projects (ACTION, etc.)
- You Be the Chemist Challenge
- Support and assist with other university recruiting activities

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**Goal 3: Conduct and communicate collaborative research in STEM and STEM education disciplines.**

**NWO Activities**
- COSMOS Research Learning Community
- Faculty presentations at NWO Symposium
- Submitting manuscripts for publication
- Faculty/staff research and participation in NWO

**Affiliated Activities**
- Faculty/staff research and participation in NWO
- Continued support of the development of the Learning Sciences PhD program
- Grant projects

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**Goal 4: Develop and sustain a regional collaborative alliance including university, school, informal education, and business partners through a shared vision and collaborative spirit for tackling current STEM education issues.**

**NWO Activities**
- STEM Consortium Advisory Board & Leadership Team
- NWO website and STEM Resource Center Website
- “NWO STEM Connection” Print and E-Newsletters
- Ohio STEM Learning Network Hub Activities
- Evaluation and Marketing Services for NWO Partners

**Affiliated Activities**
- Community Resources Workshop
- Business and community partnerships on grant projects

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**Goal 5: Support higher education faculty and future faculty in pursuit of the best practices in STEM and STEM education disciplines to enhance undergraduate and graduate education.**

**NWO Activities**
- Professional development for higher education faculty at NWO Symposium and NWO Inquiry Series
- COSMOS Research Learning Community
- Support for faculty development and administration of STEM education research and innovation grant projects

**Affiliated Activities**
- Continued support of the development of the Learning Sciences PhD program
**Educator Professional Development and Outreach**

**NWO Activities**

**Community Resources Workshop (CRW)**

**Brief Description**
This weeklong K-12 teacher professional development workshop began in 1998 through a partnership with The Toledo Museum of Art, The Blade, WGTE Public Media, The University of Toledo, and Bowling Green State University. The 40-hour Monday-Friday summer workshop, currently sponsored in part by NWO, features visits to area organizations that focus on inquiry-based, hands-on learning in both formal and informal settings. Teachers may earn 2 graduate credits from Lourdes University and enjoy meeting education specialists from exciting places such as The Toledo Zoo, Toledo Area Metroparks, Challenger Learning Center, and Toledo Lucas County Library on whom they can call for lesson plans, activities, hands-on resources, and school programming.

**Meets NWO Goals: 1 & 4**

**FY 2012 Activity Information**
In 2012, 50 teachers took part in the Community Resources Workshop (CRW) with activities delivered by Lourdes University, Toledo Area Metroparks, The Blade, The Mudhens, Challenger Learning Center, Toledo Museum of Art, Imagination Station, Toledo Lucas County Public Library, Toledo Zoo, WGTE Public Media and several guest speakers. Highlights included a visit to the Toledo Zoo, and a walking tour of downtown Toledo, the Valentine Theater and The Blade. The 50 spots available for the CRW filled up in only a matter of weeks, making it clear that this is a valued professional development program that is well received by teachers in the region.

*Continued on pages 4*
**Evaluation Summary**

The 2012 Community Resources Workshop was evaluated using a paper survey that was administered to 47 participants on the last day of the workshop. The results of the survey demonstrate that participants perceived the workshop to be of high quality and highly valuable. The findings also indicate that as a result of attending the CRW, participants were significantly more aware of community resources, held more positive attitudes regarding the use of community resources in their classroom, and planned to increase their use of community resources in their classroom. The most prominent outcome was the participants' self-reported change regarding their awareness of community resources, particularly low cost alternatives to field trips. Overall, comments given by participants regarding the CRW were extremely positive. Many of the teachers specifically wrote positive comments regarding the organization of the workshop and the value and applicability of the resources to their classroom. The 2012 Community Resources Evaluation Report offers a more thorough account of the implementation and impact of the workshop, and can be found at [www.nwocenter.org/reports](http://www.nwocenter.org/reports).

**Literacy Design Collaborative's College Ready Tools**

**Brief Description**

The Ohio STEM Learning Network is coordinating the adoption and dissemination of the Literacy Design Collaborative's College Ready Tools (LDC - CRT) throughout school districts in the State. One STEM school in each region is serving as the first adoption site. At each of those schools, four teacher leaders have been trained in the use of LDC-CRT and are teaching the other teachers in their school to also use these tools. Each of the regional STEM Hubs are supporting this development. When the first schools have fully adopted LDC-CRT they will then train three other schools. Those schools will each train three others and eventually LDC-CRT are expected to be used throughout the state. CRT is a system of learning for all of the core academic disciplines including English language arts, social sciences, natural sciences, and mathematics. CRT focuses on development of literacy skills within each of these primary domains with the aim of improving student mastery of the common core standards. The goal is to establish an aligned system for teaching college-ready literacy in all subject areas with a well-defined methodology and a clean, understandable structure. As a result, students will engage in more intense literacy practices than they now generally experience, integrated throughout all of the core disciplines, to deepen their learning and improve their critical thinking and communications skills. **Meets NWO Goals: 1, 2, & 4**

**FY 2012 Activity Information**

In northwest Ohio, Perkins Local Schools is serving as the first school to adopt LDC-CRT, thus providing inspiration and support for adoption in other schools throughout the region. In April and June a team of four teachers from Perkins Local Schools, one in each of the four core academic disciplines, participated in LDC training initiated through the Ohio STEM Learning Network in conjunction with Battelle and the Gates Foundation. These four teachers are piloting the use of CRT modules in their classes and will train all of the other core discipline teachers in Perkins High School. Later, Perkins will help train three other schools in northwest Ohio and those schools with in turn train others to spread LDC – CRT throughout the region.
**“NWO STEM Connection” Print and E-Newsletters**

**Brief Description**
The NWO STEM e-newsletter and STEM Connection newsletter are focused on bringing attention to new programs and events happening in STEM K-16 education. Monthly e-newsletters feature stories about area K-12 schools focusing on STEM learning. Each month also includes a community partner feature story revealing how business and non-profit organizations are working with K-12 schools to enhance STEM teaching and learning. The STEM Connection newsletter is published quarterly. Both newsletters feature a hands-on, inquiry-based STEM activity for easy use in K-16 classrooms, upcoming teacher professional development and student opportunities, and STEM resource announcements. **Meets NWO Goals: 1, 2, & 4**

**FY 2012 Activity Information**
In 2011-2012, NWO continued the STEM e-newsletters format that was designed the previous year. The new design focused on new graphics and a hands-on learning lesson. During the 2011-2012 school year, NWO published and emailed twelve e-newsletters to 7,000+ STEM educators, administrators, partners and stakeholders. One “NWO STEM Connection” print newsletter was written and mailed in August 2011 to more than 5,500 STEM educators, administrators, partners and stakeholders in Ohio. The e-newsletters and print newsletter published during FY 2012 can be found at www.nwocenter.org. Plans are currently in place to print two “NWO STEM Connection” newsletters in FY 13. NWO will also continue to publish the monthly STEM e-newsletters, capitalizing on recent funding to increase the number of STEM educators receiving the newsletters.

**NWO STEM Education Inquiry Series**

**Brief Description**
Sustained professional development is offered by NWO throughout the academic year in the NWO Inquiry Series. The Inquiry Series is a series of STEM professional development workshops that continues to be highly popular with educators in the region. It also functions as a monthly platform for affiliated NWO grant projects and regional educators to come together for project-specific professional development. The Inquiry Series is open to in-service and pre-service teachers, higher education faculty, and business/community partners in the region. Participants can opt to attend only one event or all the Inquiry Series events. **Meets NWO Goal: 1**

**FY 2012 Activity Information**
The 2011-12 NWO STEM Education Inquiry Series was held (for the third year) at Rossford High School on the following Thursday nights: Sept. 22, 2011, Oct. 20, 2011, Dec. 1, 2011, Jan. 19, 2012, Feb. 16, 2012, and Mar. 25, 2012. A $15/night fee was charged for all attendees (undergraduates were charged $10). The fee did not seem to reduce the number of attendees, but did provide for a reduction in the no-show rate for registration/attendance. On the next page is a list of the STEM opportunities offered at each monthly meeting and the overall attendance data. 2011-12 offered a new format for the Inquiry Series, which only offered one open session per night. All of the events were funded entirely by registration fees. Two grant projects also met at the Inquiry Series; the information on these grants is listed under USE-IT III and Project pi r² Two.

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### Session Title and Description

<table>
<thead>
<tr>
<th>Date</th>
<th>Session Title</th>
<th>Session Description</th>
<th>Presenter(s)</th>
<th>Total Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept. 22</td>
<td>Understanding the Newly Revised State Standards in Math &amp; Science</td>
<td>An in-depth look at the newly revised Ohio standards for math and science. Learn what has changed, what is staying the same, how to interpret the new standards, and what things you should be doing now to prepare yourself and your students for the upcoming change.</td>
<td>Diane Burtchin &amp; Michelle Shafer, Rossford Schools</td>
<td>89</td>
</tr>
<tr>
<td>Oct. 20</td>
<td>Formative Assessment and Understanding the Newly Revised State Standards in Math and Science</td>
<td>Learn new and innovative ways of assessing student understanding in your classroom.</td>
<td>Debra Gallagher, Ohio Northern University</td>
<td>63</td>
</tr>
<tr>
<td>Dec. 1</td>
<td>What Is Inquiry and How Do I Use It in My Classroom?</td>
<td>Tips and tools for incorporating inquiry teaching methods into your classroom with a focus on how to use the inquiry method to teach the newly revised state standards in math and science.</td>
<td>Diane Burtchin &amp; Michelle Shafer, Rossford Schools</td>
<td>34</td>
</tr>
<tr>
<td>Jan. 19</td>
<td>Motivating Students for Success</td>
<td>Discover ways to help keep your students motivated and excited about learning.</td>
<td>Jodi Haney, BGSU</td>
<td>53</td>
</tr>
<tr>
<td>Feb. 16</td>
<td>Teaching and Learning for ALL Students</td>
<td>Tools for helping all your students learn, including the new 6E Model (an updated 5E including targeted formative assessment activities) and ways to differentiate instruction.</td>
<td>Emilio Duran, BGSU</td>
<td>22</td>
</tr>
<tr>
<td>Mar. 15</td>
<td>Virtual Field Trips and Technology Tools for Your Classroom</td>
<td>Explore ways to connect with regional, state, national, and international resources without ever leaving the classroom. Simple and cost-effective steps using Skype to involve students in live interactions with exciting places, programs, and experts in STEM fields.</td>
<td>Bob Midden, BGSU/NWO</td>
<td>22</td>
</tr>
</tbody>
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### Participant Group and Attendance

<table>
<thead>
<tr>
<th>Participant Group</th>
<th>Total Attendance for 2011-12 (Unique Visitors)</th>
<th>Total Attendance for 2011-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Service Educators</td>
<td>23</td>
<td>27</td>
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<tr>
<td>K-12 Educators</td>
<td>137</td>
<td>225</td>
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<td>K-12 Administrators</td>
<td>12</td>
<td>14</td>
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<td>Higher Ed Faculty</td>
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<td>5</td>
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<tr>
<td>Community/Business Partners</td>
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<td>8</td>
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<tr>
<td>NWO Center Staff/Facilitators</td>
<td>15</td>
<td>58</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>197</strong></td>
<td><strong>337</strong></td>
</tr>
</tbody>
</table>
**Evaluation Summary**

The 2011-2012 Inquiry Series was evaluated using an online survey that was administered after each Inquiry Series event (data were collected from six surveys). The average number of survey responses each month was 33 with an average response rate of 72%. The survey required respondents to rate certain aspects of the Inquiry Series (e.g., engagement, value of information) as well as provide written comments regarding their experience. In general, the results demonstrate that attendees perceived the Inquiry Series to be engaging, valuable, informative, applicable, and motivating. The figure below illustrates the attendees’ responses regarding each Inquiry Series session.

![Attendees' perceptions of the 2011-2012 NWO Inquiry Series](image)

*Note: The mean scores reflect all of the responses collected for each session during the Inquiry Series.*

The attendees’ written comments were mostly positive and further emphasized the value of the Inquiry Series. Attendees frequently reported using (or their plans to use) the knowledge and resources gained at the Inquiry Series in their classroom. Furthermore, the comments indicate that attendees perceived the Inquiry Series to be a high quality event, with many attendees positively commenting about the hands-on nature of the Inquiry Series sessions and the expertise of the session facilitators.
NWO STEM Resource Center Website

Brief Description
The NWO STEM Resource Center website was created as part of the STEM Consortium grant received by NWO in January 2011 from the Ohio STEM committee, the Ohio Board of Regents, and the Ohio Department of Education in collaboration with the Ohio STEM Learning Network. The website is designed to be the premier website to visit when looking for STEM teaching resources in northwest Ohio. It is designed mainly to assist preK-12 educators in locating and using STEM resources in the area. Many of the resources are available in other places on the internet, but the STEM Resource Center is designed to put all the information in one searchable database where visitors can narrow their search by many filters including geographical area, grade level(s), subject area(s), type of resources, and many more. Meets NWO Goal: 4

FY 2012 Activity Information
The STEM Resource Center website was created in 2011 with funds provided by the Ohio STEM Learning Center hub grant. A beta version was launched in May 2011 for testing by the members of the NWO STEM Advisory Board. The data from this test was then used to make changes to the website and the full version launched in August 2011 for the general public. To date the website currently has 200 posts showcasing regional STEM resources and lists 318 school districts that are located in northwest Ohio. The site has a total of 78 subscribers and is viewed by hundreds more throughout the year. The STEM Resource Center can be viewed at http://nwostemresources.org.

NWO Symposium on Science, Technology, Engineering, and Mathematics Teaching

Brief Description
Over the past eight years, the NWO Symposium has brought together hundreds of participants to exchange effective strategies for teaching STEM. This popular event has provided the Center with huge visibility in the community, attracting educators to our long-term professional development opportunities and giving all participants resources and ideas they can use immediately in their classroom or setting. Meets NWO Goals: 1 & 5

FY 2012 Activity Information
The 2011 NWO Symposium was held on Saturday, November 5 at the Penta Career Center for the third year. In an effort to further our partnership with Penta, we asked their Culinary Arts Program to cater the event for the second year. A registration fee was charged for all attendees ($35 for educators and $20 for undergraduate students). Presenters remained free, but for-profit vendors were charged $100. The total attendance at the 2011 NWO Symposium was 17% lower than the attendance at the 2010 Symposium. However, the decrease in total attendance is solely due to the significantly lower number of presenters and vendors. There were 42% fewer presenters and vendors at the 2011 Symposium than were at the 2010 Symposium. This decrease was intentional, as far fewer sessions were offered in 2011 than in past years, which therefore required fewer presenters to participate. Nevertheless, while the number of presenters and vendors decreased in 2011, the
number of attendees slightly increased from 168 total attendees in 2010 to 174 total attendees in 2011. A total of 49 sessions and a keynote address by Dr. Gene Poor were offered during the 2011 NWO Symposium, with about 12 sessions being offered every hour. The charts to the right show a breakdown of the sessions offered by subject area(s) (57), grade levels (many sessions were offered for multiple grade ranges), and the overall attendance (322).

**Evaluation Summary**
The 2011 NWO Symposium was evaluated using session evaluation surveys (attendees completed a paper survey for each session they attended) and two online surveys (one for attendees and another for presenters/vendors). The results of the session evaluation surveys indicated that attendees perceived the Symposium sessions to be engaging, valuable, informative, and beneficial to the educational community. The results of the attendee online survey echoed the results of the session evaluation surveys, with 78% of attendees ranking the NWO Symposium overall as either Good (50%) or Excellent (28%). Overall however, the attendees ranked the various components of the NWO Symposium (i.e., food, venue, program book, vendor exhibits) lower than in previous years. These findings might be explained in part by changes in the Symposium timeline (e.g., two hours were given for lunch/vendor browsing; keynote was offered in the afternoon) made in 2011. Many attendees commented that the lunch/vendor break was too long, and could have been used to provide another session, or decrease the overall length of the Symposium. Despite the lower rankings, many of the comments revealed that the 2011 Symposium was a valuable learning experience that provided applicable information and resources for those who attended. Several attendees positively commented that the presenters were well prepared, enthusiastic, and knowledgeable, and several others commented on the wide variety of sessions that were available to choose from. The figure on the next page illustrates the attendees’ responses to five questions on the attendee survey.

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The results of the presenter/vendor online survey indicated that most presenters/vendors perceived that their participation in the Symposium was worthwhile due to the number and receptivity of the attendees at their session/exhibit. Most of the attendees (80%) and almost all of the presenters/vendors (93%) reported that it was moderately or very likely that they would attend or participate in the 2012 NWO Symposium. The recommendations for the 2012 NWO Symposium are to 1) Reorganize the timeline of the Symposium, 2) Offer different food choices than what was offered for the 2011 NWO Symposium, and 3) Offer more mathematics and technology sessions, as well as sessions that focus on the new Ohio standards. The 2011 NWO Symposium Evaluation Report offers a more thorough account of the implementation and impact of the 2011 NWO Symposium, and can be found at www.nwocenter.org/reports.

**Rural STEM Learning Platform**

**Brief Description**

The new STEM learning platform is intended to provide a model for rural schools that struggle with the challenge of offering a rich array of stimulating and engaging STEM courses based on problem-based learning, hands-on inquiry, and partnerships with STEM businesses due to low enrollments and lack of resources. This is being overcome in part by sharing courses among multiple school districts via distance learning, video conferencing, shared staff, and inter-school visits. The new model is being developed among the nine public school districts of Putnam County, coordinated by the Putnam County Educational Service Center. This effort is based on the impressive record of achievement of these schools in their highly effective STEM programs. It will involve creating 18 new, innovative STEM courses that will be shared among all nine school districts and made available to all students throughout the county via multiple modes of distance learning. **Meets NWO Goal: 4**

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FY 2012 Activity Information

Putnam County School Updates
In addition to the achievements listed below, many of the schools will be purchasing iPads for high school students to further their education and familiarity with technology.

Columbus Grove:
Currently offering four years of High School of Business, Bio Medical Classes, AP courses in Calculus, Statistics, English Literature, and U.S. History. A Columbus Grove teacher was awarded the Governor’s Thomas Edison Award for Excellence in STEM Education.

Continental:
Currently offering courses in Microsoft Office, Flash, Adobe Photoshop, and Vocational Agriculture. Continental students participated in the Putnam County Youth Advisory Board Video Challenge. Two teachers were awarded the Governor’s Thomas Edison Award for Excellence in STEM Education.

Ft. Jennings:
Currently offering an Environment Science Course for preK-12 students.

Kalida:
Currently offering both Project Lead The Way: Engineering and Biomedical classes.

Leipsic:
Currently offering High School of Business and Vocational Agriculture programs.

Miller City:
Currently offering Vocational Agriculture courses and Project Lead The Way: Engineering and Biomedical courses. One teacher was awarded the Governor’s Thomas Edison Award for Excellence in STEM Education. Currently a finalist in the America’s Farmers Grow Rural Education competitive grant sponsored by the Monsanto Fund.

Ottawa – Glandorf:

Ottoville:
Currently offering a locally designed Principles of Engineering Course and an Environmental Science course. Beginning at the middle school level, the district offers several robotics classes.

Pandora – Gilboa:
Currently offering Project Lead the Way: Principles of Biomedical Sciences, Human Body Systems, and Medical Interventions.
STEM Training Center at the Toledo Technology Academy

Brief Description
The Ohio STEM Learning Network is coordinating the development of seven STEM Training Centers throughout the State of Ohio. Each training center will serve the schools in its region by providing a variety of resources to encourage and support the adoption of best practices in teaching and learning in STEM subject areas.

Services provided will include:
- Professional development sessions for teachers
- Visits of teacher leaders to schools to demonstrate use of best practices in classrooms and to discuss STEM education with teachers and administrators
- Hosting visits of teachers and administrators at the training center to watch best practices in use in the classroom
- Providing access to video recorded classroom sessions that demonstrate exemplary practices
- Providing access to live video streaming of classroom activity

Each training center will specialize in certain aspects of STEM education. The Toledo Technology Academy is serving as the Training Center for northwest Ohio.

Housed at the former DeVilbiss High School on Upton Avenue, the Toledo Technology Academy (TTA) is a success story for Toledo Public Schools. TTA, one of two Toledo Public magnet high schools, scores in the top academic tier of schools in Ohio. The academy is transforming the way students learn and develop 21st century skills by offering real world experiences and classes not found in a more traditional high school curriculum. Because TTA is working so well, administrators are looking into developing a K-12 STEMM focused campus, including a new K-8 building, devoted to a science, technology, engineering, math, and medicine (STEMM) curriculum. This concept is a popular trend in education; and school leaders argue that programs focused on those disciplines prepare students for growing industries with available, well-paying jobs. The concept is also amenable to project-based learning and tends to be popular with parents.

The topics that TTA will offer includes:
- Practices for developing and strengthening partnerships with businesses
- Senior capstone projects using problem-based learning
- Leadership training
- Integrating project and problem-based learning across the curriculum

Development of TTA’s Training Center functions began in May of 2012. TTA plans to be ready to start offering these services by the beginning of spring term, 2013. Meets NWO Goals: 1, 2, & 4
**History Lab**

*Brief Description*

History Lab is a professional development project funded by the Ohio Humanities Council that aims to (1) increase teachers’ knowledge of traditional American history and science content (2) improve their ability, with the aid of humanities scholars, education faculty and informal educators, to translate this knowledge to students to improve acquisition and retention, (3) raise teachers’ awareness of and knowledge about regional historical sites, (4) increase student knowledge of local history and science content and 5) to improve the attitudes of students toward history, science, and culture through inquiry-based, hand-on activities. **Meets NWO Goal: 1**

*FY 2012 Activity Information*

History Lab engaged ten northwest Ohio teachers in a three-day summer workshop focused on improving teachers’ knowledge of American history and the instructional resources and strategies most effective in teaching American history. Teachers will continue their participation in History Lab during FY 2013 with two professional development meetings during the school year.

*Evaluation Summary*

The History Lab summer workshop was evaluated using a content knowledge assessment and a focus group interview. The results of the content knowledge assessment demonstrated that teachers significantly increased their knowledge about American history, specifically regarding the War of 1812, features of Fort Meigs, and Native American-European relations. In addition, the focus group interviews indicated that teachers perceived the workshop to be valuable and effective in improving their knowledge about history as well as their instructional practices for teaching history.

**Project pi r² two (Partners in Inquiry Resources and Research two)**

*Brief Description*

Project pi r² unites the resources of NWO and BGSU in conjunction with principal partner Toledo Public Schools, a high-need local educational agency, and additional partners Toledo Catholic Diocese, Challenger Center of Lake Erie West, Imagination Station, Sauder Village, Seven Eagles Environmental Education Center, Toledo Botanical Garden, The Toledo Zoo, Toledo Area Metroparks, and the Educational Service Center of Lake Erie West for a new model in professional development. The Principal Investigator on the project is Dr. Emilio Duran of Bowling Green State University’s School of Teaching and Learning. The program’s overall objectives are to (a) help retain and support teachers in science and technology; (b) expose teachers to effective models in science instruction; (c) integrate educational resources in the region’s classrooms to model inquiry and increase class time spent on STEM subject areas; (d) improve student inquiry science process skills and science achievement; and (e) promote the use of research-based best practices in science teaching in northwest Ohio classrooms consistent with local, state, and national standards. **Meets NWO Goal: 1**

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FY 2012 Activity Information

Project pi r² two was funded by a $108,030 Ohio Board of Regents Improving Teacher Quality grant that spanned across FY 2011 and FY 2012. This project provided 30 K-6 teachers with 100 hours of thorough and sustained professional development and reached over 1,200 students in high needs schools with state-of-the-art inquiry science education. The teachers who participated in the project represented seventeen different schools from northwest Ohio, twelve of which were public. Teachers started the project in June 2011 with a weeklong professional development opportunity called the Community Resources Workshop (see the description of the Workshop in this annual report). Teachers continued with the project through the 2011-2012 school year by attending professional development as part of the NWO Inquiry Series. A STEM faculty member from BGSU, a veteran classroom teacher, and an informal science educator facilitated these monthly professional development sessions, which focused on improving teachers’ content knowledge in life, earth, and physical science, as well their knowledge and use of inquiry-based instructional practices. Also during the school year, each teacher received six free inquiry-based science classroom programs from area partnering outreach providers. Each classroom was also visited by a scientist from an NWO-partnering institution of higher education (e.g., The University of Toledo, Lourdes University, the University of Findlay, as well as BGSU), who talked to students about what it is like to be a scientist.

Evaluation Summary

Project pi r² was evaluated using both qualitative and quantitative methods in order to more accurately evaluate the implementation and impact of the project. The evaluation findings demonstrated that the professional development activities (i.e., Community Resources Workshop, monthly sessions, outreach programs) were of high quality and modeled reform-based instruction. Teachers also perceived the activities to be valuable. The evaluation findings also demonstrated that the project positively impacted teachers’ science content knowledge as well as their beliefs and behaviors regarding science teaching. As a result of participating in the project, teachers’ content knowledge significantly improved. In addition, teachers felt significantly more confident in using reform-based instructional practices, and emphasized these practices to a significantly greater extent after participating in the project. One teacher wrote,

Project pi r² has rekindled my confidence about teaching science! It has been inspirational! Through its many facets (professional development sessions, outreach programs, formative assessment, the scientist visits) it has enlarged and broadened my science knowledge base and help me re-visit, re-energize, and re-attach to the excitement I have for teaching science.

Project pi r² also contributed to gains in student learning during the school year. Although the quantitative data could not definitively demonstrate that student gains were attributable to the project, teachers’ reflections supported this view. Many of the teachers’ reflections suggested that the project positively impacted students’ retention of information. Many others commented about the value of the visiting scientists in relation to the impact those visits had on students’ interest in science and science careers. The Project pi r² two Evaluation Report offers a more thorough account of the implementation and impact of the project, and can be found at www.nwocenter.org/reports. The figure on the next page demonstrates the impact of the project on teachers’ science teaching beliefs and behavior.

Continued on page 15
USE-IT III (Uniting Science, Education, Inquiry, and Technology III)

Brief Description
Project USE-IT III is a partnership grant with WGTE Public Media from the Martha Holden Jennings Foundation for K-8 educators interested in infusing more technology and inquiry-based pedagogy into their science lessons. The Principal Investigator is Dr. W. Robert Midden of NWO. The project is aimed at helping teachers (1) gain confidence and proficiency in teaching science content using technology; (2) gain new tools to use with already existing classroom technology; and (3) increase their comfort level with science teaching and using technology to meet the diverse needs of their students. K-8 students benefit from this project through the availability of (a) new technology tools in the classrooms that allow students to utilize technology to its fullest potential; (b) hands-on, minds-on science lessons and activities; and (c) proficient teachers who encourage critical thinking, as well as instill enthusiasm for the study of science and technology in the 21st century classroom. Teachers receive contact hours, science infused technology training, and hands-on technology to take back to their classrooms for completing the program. Meets NWO Goal: 1

FY 2012 Activity Information
USE-IT III provided 24 northwest Ohio educators with over 20 hours of professional development regarding the use of several instructional technologies, such as Google Earth, Glogster, VoiceThread, and screen casting. Teachers attended seven monthly professional development sessions from September 2011 to April 2012.
Evaluation Summary

USE-IT III was evaluated using several data sources, including professional development observations and three online surveys that measured the participating teachers’ perceptions of the professional development, beliefs and behaviors regarding science teaching, and beliefs and behaviors regarding technology integration. The observational and survey data indicated that the sessions were high in quality, with facilitators using an inquiry-based hands-on approach to address content which teachers perceived to be valuable and applicable to their classroom. Furthermore, the teachers’ survey responses indicated that the introduction of knowledge and resources from USE-IT III resulted in classroom lessons that were more interactive and student-centered. The results of the science teaching survey demonstrate that USE-IT III positively influenced teachers’ beliefs about science teaching. After USE-IT III, teachers reportedly placed a greater emphasis on reform-based strategies, and felt more confident in using those strategies than before the project. The results of the technology integration survey were more dramatic, demonstrating statistically significant improvements in every belief and behavior that was measured. After USE-IT III, teachers 1) felt more self-efficacious about integrating technology in their classroom, 2) were more familiar with the technology addressed during the project, 3) used the technology addressed during the project with greater frequency, 4) felt more prepared to use the technology addressed during the project, 5) used technology integration and 21st century learning strategies with greater frequency, and 6) felt more prepared to use technology integration and 21st century learning strategies. The figure below illustrates the changes in the teachers’ beliefs and behaviors regarding technology integration, as a result of participating in USE-IT III. The USE-IT III Evaluation Report offers a more thorough account of the implementation and impact of the project, and can be found at www.nwocenter.org/reports.

Changes in USE-IT teachers’ beliefs and behaviors regarding technology integration
Faculty Professional Development and Collaborative Education Research

COSMOS Research Learning Community

Brief Description
Faculty with a common interest in the science of STEM teaching and learning come together throughout the academic year to critique and discuss research articles, participate in action research, and design, conduct, and present collaborative research projects related to NWO/COSMOS goals and activities. **Meets NWO Goals: 3 & 5**

FY 2012 Activity Information
The 2011-12 faculty learning community “STEM Classroom Assessment and Course Evaluation” had a primary goal that each member develop rigorous and valid assessments for at least one college course that they teach. Another goal was for participants to learn how to use assessment results to guide their choice of teaching strategies and design of learning environments (action research) and to use an assessment they develop as an evaluation instrument for a research project aimed at determining the effectiveness of a pedagogical technique used in that course.

Article prepared for peer review:

**Title:** Yes I Can: The Contributions of Motivation and Attitudes on Course Performance among Biology Non-majors.

**Authors:** Matthew L. Partin, ; Haney, J. J.; Worch, E. A.; Underwood, E.; Nurnberger-Haag, J.; Scheuermann, A.; Midden, W. R.

Participation in the COSMOS Research Learning Community shows a diverse group of faculty participants from 6 university departments and 2 corresponding colleges (Arts and Sciences and Education). The community consisted of 10 regular attendees and met twice a month throughout the academic year.

Continued on page 18
**Evaluation Summary**

The COSMOS Research Learning Community (RLC) was evaluated using an online survey that was completed by the members of all learning communities campus wide. (Only the responses of the members of the COSMOS RLC were analyzed for this report.) Only three members of the COSMOS RLC completed the survey, so it is difficult to draw any definitive conclusions from the survey responses. However, the survey respondents did unanimously agree that the COSMOS RLC contributed to improvements in their teaching practices. All three respondents agreed or strongly agreed that their participation in the RLC resulted in the use of new pedagogies and learning strategies in their classes and that the RLC resulted in an increase in the number of learner-centered activities in their classes. In addition, all of the respondents predicted that would likely participate (as either a member or facilitator) in a learning community next year.

**COSMOS Team and Research Dissemination**

**Brief Description**

The Center Of Excellence in Science and Mathematics Education: Opportunities for Success (COSMOS), the BGSU branch of NWO, hosts the COSMOS Team meeting for BGSU faculty and administrators to work with NWO staff to communicate, collaborate, and champion STEM initiatives at BGSU and throughout the northwest Ohio region. This enthusiastic and supportive group has been meeting as a formal group for over 9 years and is committed to advancing STEM education for people of all ages. **Meets NWO Goal: 3**
FY 2012 Activity Information

Participation in the COSMOS Team shows a diverse group of faculty & staff participants from 6 university departments and 3 corresponding colleges (Arts and Sciences, Education, and Technology). Representatives from 5 unique undergraduate scholarship programs were also in attendance and brought new insight to the group regarding the university student experience at BGSU. The team consisted of 29 total attendees and met twice a month in the fall and once a month in the spring. This change in format reflected the growing responsibilities of the team members to their respective departments and colleges; as well as a preference to use more electronic communication throughout the year and have fewer and shorter in person meetings.

A total of 23 refereed publications and 19 refereed presentations focusing on STEM education were accomplished during FY 2012 by COSMOS Team members. A full list of presentation and publications is available in Appendix E.

NWO Faculty Participants

Brief Description

NWO has partners in colleges and universities all over northwest Ohio and southeast Michigan. These faculty assist NWO in many ways, including participating in and/or presenting at the following NWO events: (a) NWO STEM Education Inquiry Series, (b) NWO Symposium, (c) STEM in the Park, (d) OJSHS, (e) STEM Consortium Advisory Board, (f) COSMOS Research Learning Community, and (g) COSMOS Team. **Meets NWO Goals: 3 & 5**

FY 2012 Activity Information
K-12 School, Business, and Community Activities

Business and Community Partners

Brief Description
NWO impacts and works with collaborative partners all over northwest Ohio. Many institutions have become formal partners. Below is a list of some of our most active partners during FY 2012. A complete list of partners as well as the application to become an NWO partner is available at www.nwocenter.org/partners. Meets NWO Goal: 4

FY 2011 Activity Information

School Districts
These are the main district collaborations, as cited in our current grant projects; however, we recruit/disseminate to 29 counties.

• Bowling Green City Schools
• Findlay City Schools
• Fort Recovery Local Schools
• Four County Career Center
• Lima City Schools
• Maumee City Schools
• New Bremen Local Schools
• Penta Career Center
• Perkins Local Schools
• Perrysburg Exempted School District
• Putnam County Schools (9 School Districts)
• Rossford Exempted Village School District
• Springfield Local Schools
• St. Henry Consolidated Local Schools
• Sylvania Local Schools
• Toledo Public Schools
• Toledo Technology Academy
• Vanguard-Sentinel Career Center
• Sandusky City Schools

Businesses

• Ball Corporation
• BP-Husky, LLC
• Carolina Biological Supply
• Delta Education
• Educaching
• Libbey Glass
• Mother Hubbard’s Learning Cupboard
• Perstorp Polyols, Inc.
• Sheridan Worldwide
• Texas Instruments
• Toledo Zoo
• Time Warner Cable
• Tony Packo’s
• Walmart

Continued on page 21
Educational Service Centers

- Hancock County
- Lake Erie West
- Mid-Ohio
- North Central Ohio
- Northwest Ohio
- Putnam County
- Shelby County
- Wood County

State Support Teams

- Region 1
- Region 6
- Region 7

Community & Non-Profit Organizations

- Armstrong Air and Space Museum
- Challenger Learning Center of Lake Erie West
- Fort Meigs: Ohio’s War of 1812 Battlefield
- Imagination Station
- Lucas County Soil and Water Conservation District
- Northwest Ohio Educational Technology (NWOET)
- Sauder Historical Village
- Toledo Area Metroparks
- Toledo Blade
- Toledo Botanical Gardens
- Toledo Museum of Art
- WGTE Public Media

Ohio Junior Science and Humanities Symposium (OJSHS)

Brief Description

OJSHS brings the best and brightest students from Ohio middle and high schools together for a competition to highlight and judge the quality of their research projects in the sciences and humanities. This event is an excellent opportunity for the recruitment of the next generation of scientists, mathematicians, engineers, and teachers. OJSHS is co-sponsored by NWO and a grant from the Academy of Applied Science. Paper and poster presentations by these students demonstrate a level of achievement that would rival some of the very best junior and senior undergraduate students with some even approaching what is expected of beginning graduate students. Past Ohio winners have gone on to win the top award at the National competition, demonstrating the extraordinary talent and achievement of these students. **Meets NWO Goal: 2**

FY 2012 Activity Information

Bowling Green State University hosted the 3-day, 2012 event for the fourth year in a row from March 21-23. OJSHS participants were once again charged a $25 registration fee. This fee was recommended by parents and teachers to help cover the costs of running the symposium. The keynote address was Dr. Peg Yacobucci, a Professor in the Department of Geology at BGSU. There were 25 paper presentations and over 76 poster presentations. Christopher Ellis from Sylvania Southview High School was the 1st place winner for paper presentations with his project titled “Role of Glutamate Transporter 1 Activation on Chronic Alcohol Consumption in Wistar Rats”. Christopher, along with 4 other OJSHS winners traveled to the National JSHS in Bethesda, Maryland in April 2012. A complete program and other information about the 2012 OJSHS can be found at www.ojshs.org. On the next page is a break-down of attendance data for the 2012 Symposium.
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<th>Participant Group</th>
<th>Total Attendance for 2012</th>
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<tr>
<td>K-12 Educators</td>
<td>10</td>
</tr>
<tr>
<td>Higher Education Faculty (Poster &amp; Paper Judges)</td>
<td>27</td>
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<td>Staff and Volunteers</td>
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<tr>
<td>Parents and Guests</td>
<td>24</td>
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<td><strong>TOTAL</strong></td>
<td><strong>196</strong></td>
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</table>

**Evaluation Summary**

The 2012 OJSHS was evaluated using an online survey, which was completed by participating students, teachers, parents, paper and poster judges, and OJSHS staff and volunteers. The total number of survey responses was 76 for students and 40 for non-students. The results of the survey demonstrate that both students and non-students perceived the 2012 OJSHS as a high-quality worthwhile event. Most of the participants (88%) rated the 2012 OJSHS overall as either good or excellent. Furthermore, most OJSHS components (e.g., evening activities, paper and poster judges, awards ceremony) were rated as good or excellent by more than 75% of participants. The survey results also indicate that the 2012 OJSHS increased student interest in STEM research and careers and provided students with opportunities to network with other students and STEM professionals. And although it is likely that most of the participating students were already interested in STEM, many non-student participants suggested that the OJSHS provided students with motivation to continue learning and conducting research about STEM. The recommendations for the 2013 OJSHS event are to 1) provide students with a rubric for poster judging prior to OJSHS, 2) reinstate a competitive ranking system for poster projects, and 3) continue to offer ice skating, curling, and add other activities. The 2012 OJSHS Evaluation Report offers a more thorough account of the implementation and impact of the event, and can be found at [www.nwocenter.org/reports](http://www.nwocenter.org/reports).
STEM Consortium Advisory Board

**Brief Description**
The NWO STEM Consortium Advisory Board was created as part of the STEM Consortium grant that NWO received from the Ohio STEM committee, Ohio Board of Regents, and Ohio Department of Education in association with the Ohio STEM Learning Network. *Meets NWO Goal: 4*

**FY 2012 Activity Information**
The Advisory Board advised and guided the organization, implementation, and assessment of the NWO STEM Hub ensuring that the voices of all STEM education stakeholders of northwest Ohio are heard and regional needs are met. The Advisory Board included members from several different participants groups in order to have adequate representation of all STEM constituencies in northwest Ohio.

The Advisory Board met periodically to generate ideas, provide advice regarding direction and strategies, raise awareness of opportunities, foster collaboration, form new partnerships and strengthen existing partnerships, recruit resources for new initiatives, and help to ensure that the Hub is serving the greater good of the entire region. Attendance information by participant group is available below.

![Advisory Board Membership by Participant Group](chart-image)
STEM in the Park

**Brief Description**

STEM in the Park is a free NWO event for all northwest Ohio families and the entire community to stimulate public interest and encourage learning in science, technology, engineering, and mathematics (STEM). Held on the campus of Bowling Green State University, the event features three hours of engaging hands-on STEM activities from over 50 area businesses, schools, and organizations along with take-home STEM activity cards for parents and children to continue STEM exploration at home. By increasing awareness in STEM facilities, programs and activities in the area, STEM in the Park is an opportunity for businesses, universities, K-12 schools, and non-profit organizations to showcase innovation, educational opportunities, and careers and to promote positive attitudes toward STEM teaching and learning. **Meets NWO Goal: 2**

**FY 2012 Activity Information**

The September 10, 2011 event provided free lunch from Tony Packo’s for all participants. Over 50 exhibitors were involved in STEM in the Park including many NWO community and business partners and university departments. Almost half (41%) of the activity stations included make-and-take activities that resulted in products attendees could take with them. Some of the make-and-take products included a soda bottle terrarium, “flubber”, ice cream, muskets (made from paper and gum balls), and hand-dipped candles. In addition, almost half of the stations provided attendees with take home activity cards (which could also be accessed online after the event). Sponsors for the event included BGSU, NWO, BP-Husky, Coca-Cola, Tony Packo’s, and The Andersons. Attendees at STEM in the Park 2011 (who completed the evaluation survey) came from sixteen different counties in northwest Ohio and southeast Michigan. Most of the attendees were from Bowling Green and the greater Toledo Area, but the event also attracted families from other cities and towns in northwest Ohio and southeast Michigan. Below is attendance data as well as a breakdown of the types of exhibitors at the event. A complete list of exhibitors is available at [http://nwocenter.org/STEMinPark](http://nwocenter.org/STEMinPark).

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**STEM in the Park Attendance by Participant Group**

- Adults: 103
- Children 0-2 Yrs.: 22
- Children 3-5 Yrs.: 5
- Children 6-10 Yrs.: 3
- Children 11-13 Yrs.: 1
- Children 14-18 Yrs.: 1
- NWO Center Staff & Volunteers: 1
- Exhibitors: 3

**STEM in the Park Exhibitors by Partner Category**

- Institutions of Higher Education: 22
- K-12 Schools: 6
- Community/Business Partners: 3
- BGSU Departments, Schools, & Colleges: 3

*Continued on page 25*
**Evaluation Summary**

The 2011 STEM in the Park event was evaluated using two online surveys (one for attendees and another for exhibitors). The total number of responses to the attendee and exhibitor surveys was 170 and 31, respectively. Most of the attendees reported staying at STEM in the Park for 2 hours and visiting 11 to 20 activity stations. And while only half of the attendees reported doing the take home activities that were handed out during the event, 87% reported that they would probably or definitely do some of the activities in the future. In response to the question, “What were your family’s favorite activity stations?,” all but four stations were listed by at least one respondent, and several respondents wrote that they liked all of the activity stations. This finding indicates that the activity stations were high in quality and appealed to the preferences of many different people. The results of the attendee survey demonstrated that STEM in that Park was successful in engaging attendees in STEM activities, as well as increasing their knowledge and awareness of STEM. Two attendees wrote:

- *I want to say THANK YOU for putting on such an amazing event. I’m always trying to find educational but fun activities for my kids (ages 2, 4, 6), but couldn’t come up with many ideas until now. I really enjoyed the event and my kids did too!*

- *It’s hard to find free/inexpensive things to do with children and this was the jackpot! Highly recommend it!*

In addition, a majority of the attendees reported that after coming to STEM in the Park, their children were much more interested in STEM and their family was much more likely to do activities related to STEM. The results of the exhibitor survey mirrored those of the attendee survey – most of the exhibitors reported that the children and parents that visited their station were substantially engaged with the STEM activities. In addition, almost all of the exhibitors reported that STEM in the Park was a worthwhile experience, and most reported that being an exhibitor was beneficial for their organization. The recommendations for the 2012 STEM in the Park event are to: 1) consider making STEM in the Park longer than three hours, 2) regardless of the weather, consider holding STEM in the Park indoors again, 3) maintain the number of volunteers that worked at STEM in the Park 2011. The figure to the right illustrates the attendees’ responses to four of the questions on the attendee survey. The 2011 STEM in the Park Evaluation Report offers a more thorough account of the implementation and impact of the event, and can be found at [www.nwocenter.org/reports](http://www.nwocenter.org/reports).
You Be the Chemist Challenge

**Brief Description**
The You Be the Chemist (YBTC) Challenge is a fun and innovative academic competition that engages 5th-8th grade students in learning about important chemistry concepts, discoveries, and chemical safety. Challenge competitions are exciting events that take place across the country, encouraging the collaboration of community organizations, schools, and the chemical industry, as together they educate students about the benefits and value of chemistry. Ohio schools take part in local challenges within their school districts, and winners attend a state competition held in northwest Ohio to qualify for the YBTC National Challenge.

Meets NWO Goal: 2

**FY 2012 Activity Information**
The Ohio YBTC Challenge competition was held May 2, 2012 at the Imagination Station in downtown Toledo. Area sponsors included NWO, PVS, ACS Chemistry for Life, and Imagination Station. Robert Mendenhall, Science Director for Toledo Public Schools, chaired the event. The Ohio winner, Michael Allen, a sixth grader from the Franciscan Academy in Sylvania, Ohio went on to place second at the national completion in Philadelphia, PA on June 25, 2012.

**NWO Role in YBTC in FY 2012**
- Staffing support provided for event organization and planning
- Funding for student awards and certificates of participation
- Advertisement/recruitment via Constant Contact to ~ 7,000 regional K-12 contacts
Affiliated Grant Projects

Science and Math Education in ACTION (ACTION)

Brief Description
BGSU, in collaboration with three regional community colleges and The University of Findlay, received $3,000,000 in funding from the Ohio Board of Regents through the Choose Ohio First program to recruit and train undergraduates to become Ohio mathematics and science teachers. ACTION focuses on the use of innovative strategies for preparing highly effective science and mathematics teachers for grades 5-12. Students involved in the project participate in: (a) a 5-week summer bridge program preceding the first regular semester of college; (b) a collaborative science or mathematics research team that addresses a real community problem or concern; (c) a co-op or internship work experience in a regional science or mathematics related business or industry; (d) early teaching experiences in a regional school; and (e) the creation of a capstone project that involves applying research techniques to determining the best teaching practices that advance the students’ learning. Meets NWO Goal: 2

NWO Role in ACTION in FY 2012
• Assistance with the undergraduate research component of the project
• Assistance and advice for project activities and logistics

Building Ohio’s Sustainable Energy Future (BOSEF)

Brief Description
BOSEF is a scholarship project funded by the Choose Ohio First program of the state of Ohio. BOSEF increases the recruitment, training, and graduation of STEM students to supply the growing job markets in renewable energy and sustainable environment technologies. Northwest Ohio has a growing reputation for research, development, and manufacturing in the high technology, renewable energy fields of photovoltaics (PV) and wind. In addition, northwest Ohio has major research and development strengths in environmental analysis and remediation technologies. The University of Toledo (UT), Bowling Green State University (BGSU), and the community colleges of Owens, Terra, and Northwest State work together to leverage the enormous public interest and burgeoning job markets in these fields to recruit,

Continued on page 28
educate, and retain the best and brightest of Ohio’s students to support these rapidly developing high tech professions. Student success is enhanced through a cooperative summer bridge program focused on mathematics, undergraduate research experiences for all, and integration with the Wright Center for PV Innovation and Commercialization, the Lake Erie Research Center, Center of Photochemical Sciences, and the Environmental Remediation and Restoration Experimental Park. It prepares students for scientific and technical careers by providing internships with business, industry, agencies, and non-profits in renewable energy and environmental sustainability fields. Although the primary program focus is on the undergraduate STEM pipeline, it will include PhD students and in-service high school teachers working toward MS degrees. The participating institutions have a comprehensive and vertically integrated approach to STEM education that maximizes student success and provides skilled professionals in these crucial STEM areas. Meets NWO Goal: 2

NWO Role in BOSEF in FY 2012
- Oversight and management of the grant project including financial management of the grant budget
- Direct recruitment of students through AIMS and the chemistry and physics depts. at recruiting events
- Advertisement/recruitment to ~ 4,300 regional K-12 contacts
- Advertisement/recruitment at NWO Inquiry Series
- Management of scholarship awards and renewals
- Student advising

Granting Access to Mathematics and Science (GRAMS)

Brief Description
GRAMS (Granting Access to Mathematics & Science) is a scholarship program supported by two 5-year grants totaling $1,200,000 from the National Science Foundation. In this project, Bowling Green State University collaborates with two regional community colleges, Owens and Terra, to increase the number of highly qualified and capable students who are able to complete degrees in STEM majors by providing approximately 20-30 need-based scholarships and a proven support program to foster student success. Student persistence and success will be fostered with two major projects: (a) our NSF-funded STEP grant project Science, Engineering, and Technology Gateway Ohio (SETGO) and (b) the BGSU Academic Investment in Mathematics and Science (AIMS). These programs include a 5-week summer bridge for entering students, to prepare them for the rigors of college science and math courses; a tiered system of mentoring by peers and faculty; learning communities with monthly events that draw students and faculty together by merging academics and social networking; and summer research opportunities. These strategies have been proven in BGSU’s AIMS program to increase student persistence and success, particularly of under-represented minority students majoring in science and math disciplines and are based on research that has identified the factors that most account for student attrition from these disciplines. Meets NWO Goals: 2 & 3

NWO Role in GRAMS in FY 2012
- Oversight and management of the grant projects including financial management of the grant budgets
- Direct recruitment of students through AIMS and SETGO at recruiting events
- Advertisement/recruitment to ~ 4,300 regional K-12 contacts
- Advertisement/recruitment at NWO Inquiry Series
- Management of scholarship awards and renewals
- Student advising
## FY 2012 NWO Budget

### FY 2012 Income Sources

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<th>Category</th>
<th>Total Expenditures</th>
<th>BGSU*</th>
<th>Grant Programs</th>
<th>Activity Revenue &amp; Sponsorships</th>
<th>Carryover</th>
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### General NWO Activity

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### Core NWO Programs

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<td><strong>TOTAL</strong></td>
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<td>$240,704.00</td>
<td>$591,419.94</td>
<td>$43,237.64</td>
<td>$134,684.28</td>
<td>$1,010,045.86</td>
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</tbody>
</table>

* Includes grant cost share dollars.
^ BOSEF Carryover from FY 2011.
** Personnel includes NWO Staff, faculty, and students.
NOTE: Budget does not reflect funds from the ACTION grant.

Continued on page 30
The table below shows funding sources that supported FY 2012 NWO Activities.

### BGSU FUNDS

<table>
<thead>
<tr>
<th>Agency: Program</th>
<th>Description</th>
<th>Award Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bowling Green State University</td>
<td>• Director • Assistant Directors • Secretary • Fringes • Faculty Associates • Operating Budget</td>
<td>$192,750.00</td>
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<tr>
<td>Fiscal Support for NWO/COSMOS</td>
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<tr>
<td>BGSU Cost Share</td>
<td>BOSEF: Building Ohio’s Sustainable Energy Future - BGSU portion (Year 3 of 5)</td>
<td>$47,954.00</td>
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<td>Carryover</td>
<td>COSMOS Carryover from FY 2005–2011 Funds</td>
<td>$104,837.50</td>
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<td></td>
<td>BOSEF Carryover from FY 2011 Funds</td>
<td>$29,846.78</td>
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<td><strong>BGSU FUNDS TOTAL</strong></td>
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<td><strong>$375,388.28</strong></td>
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### ACTIVITY REVENUE AND SPONSORSHIPS

<table>
<thead>
<tr>
<th>Agency: Program</th>
<th>Description</th>
<th>Award Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Resources Workshop</td>
<td>Revenue from Registrations</td>
<td>$7,820.00</td>
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<tr>
<td>NWO Inquiry Series</td>
<td>Revenue from Registrations</td>
<td>$6,070.00</td>
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<tr>
<td></td>
<td>Rossford Schools (Inquiry Series Host)</td>
<td>In-Kind</td>
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<tr>
<td>NWO Symposium</td>
<td>Revenue from Registrations</td>
<td>$5,750.00</td>
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<td></td>
<td>Penta Career Center (NWO Symposium Host)</td>
<td>In-Kind</td>
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<tr>
<td>OJSHS</td>
<td>BGSU Department Sponsorships</td>
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<td></td>
<td>Revenue from Registrations</td>
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<td>Partner Projects w/ NWO</td>
<td>Best of the Outdoors Page Workshop Registrations</td>
<td>$760.00</td>
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<td>Parking Fees for Common Core for Reasoning and Sense Making: Secondary Grant Program</td>
<td>$176.00</td>
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<td></td>
<td>Misc.</td>
<td>$2,971.64</td>
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<td><strong>2011 STEM in the Park Sponsor</strong></td>
<td>BGSU Colleges &amp; Departments</td>
<td>$3,800.00</td>
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<td></td>
<td>Time Warner Cable</td>
<td>$2,500.00</td>
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<td><strong>2012 STEM in the Park Sponsors</strong></td>
<td><strong>Sponsors (Total Donation)</strong></td>
<td><strong>Used in FY 2012</strong></td>
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<td></td>
<td>BGSU Colleges &amp; Departments ($9,050)</td>
<td>$9,560.00</td>
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<td></td>
<td>Bowling Green Community Foundation ($1,500)</td>
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<td></td>
<td>BP-Husky ($5,000)</td>
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<tr>
<td></td>
<td>Time Warner Cable ($2,500)</td>
<td></td>
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<tr>
<td></td>
<td>Walmart ($2,500)</td>
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<tr>
<td><strong>ACTIVITY REVENUE AND SPONSORSHIPS TOTAL</strong></td>
<td></td>
<td><strong>$43,237.64</strong></td>
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### GRANT PROGRAMS

<table>
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<tr>
<th>Agency: Program</th>
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<th>Award Amount</th>
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</thead>
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<tr>
<td>Academy of Applied Science</td>
<td>Ohio Junior Science &amp; Humanities Symposium</td>
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<td>Ohio Humanities Council</td>
<td>History Lab</td>
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<td>OSLN/Battelle Foundation</td>
<td>Ohio Race to the Top</td>
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<td>Gates Foundation Subaward</td>
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<td>OSLN Hub Grant</td>
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<tr>
<td>Ohio Board of Regents: ITQ Program</td>
<td>Project pi r² two</td>
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<tr>
<td>Martha Holden Jennings Foundation</td>
<td>USE-IT III</td>
<td>$20,990.00</td>
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<td>National Science Foundation: S – STEM</td>
<td>GRAMS (Year 3 of 5) &amp; GRAMS II (Year 2 of 5)</td>
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<td>Ohio Board of Regents: Choose Ohio First Program</td>
<td>BOSEF (Year 3 of 5)</td>
<td>$127,650.00</td>
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<td>Ohio Environmental Education Fund</td>
<td>Energy Explorations (Imagination Station subaward for Evaluation Services)</td>
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<td>Toledo Community Foundation</td>
<td>SPACE 2011 (Lucas County ESC subaward for Evaluation Services)</td>
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<td>Ohio Board of Regents: ITQ Program</td>
<td>Science Teaching Advancement through Modeling Physical Science (STAMPS II) (BGSU Subaward for Evaluation Services)</td>
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<td>eTech Ohio</td>
<td>STeM 2 STEM (Ohio Northern University subaward for Evaluation Services)</td>
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**GRANT PROGRAMS TOTAL**

$591,456.59

**TOTAL INCOME FOR FY 2012**

$1,010,045.86

### GRANTS SUBMITTED IN 2012

<table>
<thead>
<tr>
<th>Agency: Program</th>
<th>Description</th>
<th>Award Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGSU Foundation</td>
<td>2012 STEM in the Park <em>(Awarded)</em></td>
<td>$4,000.00</td>
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<td>Kroger</td>
<td>2012 STEM in the Park <em>(Awarded)</em></td>
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<td>National Science Foundation: MSP/Targeted Awards</td>
<td>iEvolve with STEM (5 years) <em>(Awarded)</em></td>
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<td>Ohio Board of Regents: ITQ Program</td>
<td>Partners in Inquiry Resources &amp; Research (Project pi r² three) <em>(Denied)</em></td>
<td>$122,739.00</td>
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<tr>
<td>Ohio Board of Regents: ITQ Program</td>
<td>Guiding Educators through Content Knowledge to create Opportunities for Success (GECKOS) <em>(Denied)</em></td>
<td>$131,931.00</td>
</tr>
</tbody>
</table>
Appendices

A. Community Resources Workshop Recruitment Email
B. Faculty and Student Recognition
C. “NWO STEM Connection” Print and E-Newsletters
D. NWO STEM Education Inquiry Series Advertising
E. NWO Publications and Presentations
F. NWO Symposium Advertising
G. OJSHS Recruitment Email
H. STEM in the Park Advertising
I. USE-IT III Recruitment Email
Appendix A: Community Resources Workshop Recruitment Email

REGISTRATION NOW OPEN!

2012 Community Resources Workshop for Educators
June 18-22, 2012

Spend a Week of Your Summer Vacation on a Fun-Filled Field Trip for Educators While You Earn College Credit or 40 Contact Hours!

You'll visit some of northwest Ohio's best informal and formal education institutions as well as learn about hidden gems to energize classroom instruction!

Here's what some participants had to say about last year's workshop:

"...an awesome opportunity to become aware of endless resources..."

"This workshop should be a requirement for all teachers!"

"This workshop was excellent. I was unaware of the resources available and the willingness and funds for making these services available. I will share this info with my colleagues."

"This was one of the best workshops that I've ever attended."

This opportunity is open to all educators, administrators and pre-service teachers. We welcome homeschooling educators.

This workshop is recommended for preK-8 teachers but all educators are welcome and encouraged to attend.

Join us for an exciting week packed with activities addressing the new Common Core Standards, STEM learning and 21st Century Skills.

See http://www.nwocenter.org/CRW/CRWhome.htm for details.

Register and pay the registration fee online at http://www.nwocenter.org/CRW/RegInfo.htm

Additional Payment Information:
After online registration is completed, you may also pay by check or school purchase order are also accepted. Title I Part A Funds and Title III Funds may be used for this workshop. Register online, then please send checks or purchase orders to:
NWG/Community Resources Workshop
2411 Math Science Bldg, BGSU
Bowling Green, OH 43403

Special on graduate credit
In addition, Lourdes University is offering 2 graduate credit hours for the one week course at a special discounted rate of just $300 per credit hour. That means you can receive two graduate credits for only $600. Plans are also in the works for a three credit hour option. Contact Robin Kratzer for information at: rkratzer@lourdes.edu

**The graduate credit fee is an add on to the $150 registration fee and can be easily arranged through Robin Kratzer at Lourdes University.

Your Community Resource Partners are:

THE BLADE toledoblade.com/site
NIA
BGSU
BGSU
LOURDES
LifeLab
Westgate
Imagination
TOLEDO ZOO
METRO-PARKS
Appendix B: Faculty & Student Recognition

BGSU faculty make good Toledo Zoo neighbors

From barnyard goats to exotic birds, kids can explore and learn in Nature's Neighborhood at the Toledo Zoo.

Three BGSU faculty members helped make it an engaging experience for children, and now have helped Nature's Neighborhood gain national recognition. The Association of Zoos and Aquariums (AZA) recently presented Nature's Neighborhood Top Honor in exhibit design. The 2011 AZA Exhibit Award recognizes excellence in the area of live animal display and exhibit design by an AZA-accredited institution or related facility member.

“The AZA Exhibit Award recognizes the Toledo Zoo as a real leader in educating and inspiring children,” said AZA president and CEO Jim Maddy. Nature's Neighborhood, with its innovative approach to exhibit design, animal care and conservation education, demonstrates how the Toledo Zoo, and all AZA-accredited zoos and aquariums, are more important than ever to children, families and communities.”

Dr. Jodi Haney, who has a joint appointment to the School of Teaching and Learning and the environment and sustainability, Rick Warsh, School of Teaching and Learning, and Amy Schuemann, formerly with the School of Intervention Services, worked with the Toledo Zoo education team on the design and development of Nature's Neighborhood beginning in 2007.

“This was an extension of what COSMOS as well as many of our earlier science education initiatives advocate: experiential learning,” Haney said.

She and Warsh recently conducted an extensive internal evaluation of Nature's Neighborhood play spaces. One assessment technique employed behavior mapping, a process utilizing GIS software to construct maps of the play spaces in order to examine where pertinent behavioral observations data (such as types of science learning, type of play, and level of physical activity) took place in those spaces.

On learning of the award, Mitzi Magdic, Toledo Zoo education curator, said he thought that “the summative evaluation piece had a big impact. What made our application so outstanding was the science and analyses that went with the qualitative, particularly behavior mapping.”

The Toledo Zoo is proud to accept the 2011 Exhibit Award for Nature's Neighborhood and looks forward to inspiring young minds for generations to come,” said Toledo Zoo CEO and Executive Director Dr. Anna Baker.
Appendix B: Faculty and Student Recognition cont.
Appendix B: Faculty and Student Recognition cont.

BGSU promotes math, science

STEM in the Park will offer hands-on activities for families

Written by Sentinel-Tribune Staff
Wednesday, 24 August 2011 07:48

Rockets and earthquakes and snakes, oh my! STEM in the Park will have that and so much more for families and people of all ages on Sept. 10, from 10 a.m. to 1 p.m.

More than 50 unique exhibitors will host hands-on STEM activity stations at the event with over 70 tables of activities that kids from 2 to 102 can enjoy.

NWO, the Northwest Ohio Center for Excellence in STEM Education at Bowling Green State University, is organizing this free event on the BGSU campus for the entire Northwest Ohio and Southeast Michigan community.

NWO is a partnership among a number of area universities, K-12 schools and community partners who all come together at this event to showcase innovation and educational opportunities and promote positive attitudes toward STEM teaching and learning. STEM activity station hosts include Fort Meigs, Challenger Learning Center of Lucas County; PNC Bank, PVG Norwood Chemicals, University of Toledo, Ohio Northern University, BGSU’s Marine Lab, Lourdes College, Penta Career Center, and Imagination Station plus over 40 other institutions and organizations.

Everyone who registers at the event will receive free STEM experiments to take home, an event map and free lunch catered by Tony Packo’s. While at STEM in the Park visitors can set off rockets, pet lizards, play with bubbles, create puppets and make ice cream.

STEM in the Park is the brainchild of Drs. Emilio and Lena Ballone Duran, both faculty members at BGSU. Inspired by Literacy in the Park, a spring on-campus event that brings families in for a variety of literacy-boosting activities, STEM in the Park seeks to increase public engagement in STEM (Science, Technology, Engineering, and Mathematics).

Last year’s event had more than 1,600 people in attendance.

This year’s festivities will take place outside the Bowen-Thompson Student Union and parking is free in lots A and B on Wooster Street, or 4A and 5 on Thurner Avenue. In the event of inclement weather, STEM in the Park will be held inside Perry Field House.

Visit nwocenter.org/STEMinPark for updates and more information.

STEM in the Park is sponsored by BGSU colleges and departments, Tony Packo’s, Coca-Cola, The Andersons and BP Husky, LLC.
Appendix B: Faculty and Student Recognition cont.

**BGSU welcomes future scientists at Kids’ Tech University**

Why are tomatoes red? What can fossils tell us about the past and future of our planet? Kids’ Tech University at Bowling Green State University is designed to let kids explore scientific concepts through hands-on activities as they discover more about the world and nature.

A research program for children ages 8-12, Kids’ Tech is presented by real scientists answering real questions.

Each day includes a morning interactive session with faculty followed by lunch and an afternoon of related learning activities. An online component continues students’ engagement after the campus activities have been completed.

The semester kicks off in January with Dr. Reinhard Luger and Dr. Virginia Biocinics, an associate professor of geology, present fossils and what we can learn from them.

Dr. David Franks, associate professor of zoology and ornithology, leads the March session, on DNA.

**Kids’ Tech University at BGSU opens world of science**

**BOWLING GREEN, O.-** Following the successful launch of the Kids’ Tech University (KTU) program at Bowling Green State University last year, the University has announced the lineup of invited speakers for the 2012 programs. This year the KTU is being held on the Bowling Green State University campus. Additional support comes from MS.

The spring semester event is for kids ages 7-12, who will be learning about life science, technology, engineering, and mathematics by exploring children’s interests in the world.

The spring semester event is for kids ages 7-12, who will be learning about life science, technology, engineering, and mathematics by exploring children’s interests in the world.

Registration will be limited to 100 children, and starts at 6 p.m. on Dec. 15. Register online at http://kstech.university.bgsu.edu/kstu-registration.php.

Following the events:

On Feb. 9, Dr. Jennifer Kay of the National Center for Climate Research in Boulder, Colo., will discuss “Bright Light, Bouncing Cones: How Climate and Ice Affect Our Planet!” her website is http://www.gfdl.noaa.gov/serve/kstu/

On Feb. 16, Dr. Craig Zirbel, a BGSU professor of mathematics and statistics, will share “Practical Math for the Digital Age!” Learn more about him at http://www.math.bgsu.edu/.

On April 4, Dr. Brett Tyler, director of the Center for Genomes and Biocomputing at Oregon State University, will present “Why My Banana Doesn’t Get the Flu.” His website is http://www.sagebase.org/.

In the last session, on April 23, Dr. Ron Woodruff, distinguished professor of biological sciences at BGSU, will discuss “What Can Tell Us About Human Health and Evolution?” Learn more about him at http://www.bgsu.edu/departments/biology/people/woodruff/.

Kids’ Tech at BGSU is directed by Dr. Paul Morris, a professor of biology, and is funded through the U.S. Department of Agriculture National Institute of Food and Agriculture grant, which calls for participating universities to help prepare the next generation of scientists.
Perkins Local Schools Pilots the Literacy Design Collaborative College Ready Tools

Literacy Design Collaborative College Ready Tools (LDC - CRT) are being adopted in Perkins Local Schools to provide inspiration and support for adoption in other schools throughout Northwest Ohio. CRT is a system of learning for all of the core academic disciplines including English language arts, social sciences, natural sciences, and mathematics. CRT focuses on development of literacy skills within each of these primary domains with the aim of improving student mastery of the common core standards.

CRT instruction is based on teaching modules. At the core of a teaching module is a specific teaching task, which is a writing assignment with a given purpose: narrative, argumentation, or informational/explanatory. These are usually oriented around a big question of some significance. In addition to the teaching task or overall assignment, the module includes mini-tasks that are designed to develop students’ ability to successfully complete the teaching task. Modules also include well-defined rubrics that guide student completion of the assignment and are used by teachers to assess student mastery.

continued on page 2
Appendix C: “NWO STEM Connection” Print and E-Newsletters cont.
NWO Symposium on Science, Technology, Engineering, and Mathematics Teaching
Saturday, November 5, 2011 (8:00 am – 4:00 pm)
hosted at the Penta Career Center

This year’s event offers an opportunity to participate in a high-quality professional conference and interact with other preK-12 educators and administrators.                     There will be sessions covering all grade levels and subject areas. There’s something for everyone!

Registration Fee: $35 (deadline Oct. 21); $45 Onsite
Multiple Participant Discount ($30/person) for 5 or more participants from the same school.

4.5 x 11 PD Flyer

NWO Symposium on Science, Technology, Engineering, and Mathematics Teaching
Saturday, November 5, 2011 (8:00 am – 4:00 pm)
hosted at the Penta Career Center

This is your opportunity to participate in a high-quality professional conference and interact with other preK-12 educators and administrators. There will be sessions covering all grade levels and subject areas. There’s something for everyone!

Registration Fee: $35 (deadline Oct. 21); $45 Onsite
Multiple Participant Discount ($30/person) for 5 or more participants from the same school.
Appendix E: NWO Publications and Presentations

Publications


Appendix E: NWO Publications and Presentations cont.


Presentations


Duran, E. (2012). What is Inquiry? Workshop presented at the Toledo Metro Parks, Toledo, OH.

Appendix E: NWO Publications and Presentations cont.


Matney, G.T. (2011). Developing number in the early years. Invited speaker at the Early Childhood Conference, Continuing and Extended Education at BGSU, Bowling Green, OH.


Worch, E. A. & Mott, D. (2011). Teaching mathematics and science through inquiry in middle and high school classrooms. 5-day workshop facilitated at Lima City Schools (OH).
NWO Symposium on Science, Technology, Engineering, and Mathematics Teaching

Saturday, November 5, 2011
8:00 AM – 4:00 PM
hosted at the Penta Career Center

This is your opportunity to participate in a high-quality professional conference and interact with preK-12 educators and administrators. There will be sessions covering all grade levels and subject areas; there’s something for everyone!

The 2011 NWO Symposium features sessions specially designed for pre-service teachers to help you navigate the interview process and provide tips and tools for managing your first year of teaching.

Registration Fee: $35 for educators and administrators and $15 for undergraduate students (deadline Oct. 21)

Information & Directions available at: http://nwocenter.org
Contact Hour Certificates Available

Partial funding provided by Ohio STEM Learning Network (OSLN)
Imagine. Design. Create

The 49th Annual Ohio Junior Science & Humanities Symposium, hosted by Bowling Green State University

March 21-23, 2012

Call for High School Research Papers and Posters

Sponsored by the Northwest Ohio Center for Excellence in STEM Education (NWO) and The School of Teaching and Learning at Bowling Green State University.

In cooperation with The Academy of Applied Science and with the support of the Departments of the Army, Navy, and Air Force.

Important Deadline — February 17, 2012

• Online registration is required for all participants including Paper Presenters, Poster Presenters, Teachers, Student Delegates.
• Registration fee: $25 per student
• Poster Presenters must submit an Abstract during the registration process.
• Paper Presenters must submit an Abstract and a copy of the Research Paper during the registration process.

Visit our web site for more information – www.ojshs.org
Appendix H: STEM in the Park Advertising

Free Family Event

Saturday, Sept. 10, 2011
10 am – 1 pm at BGSU
On lawn by Student Union
FREE parking in lots A & G on Wooster or 4, 4A, & E on Thurstin
(Rain site: Perry Field House)

Rockets and Earthquakes and Snakes, oh my!

Join us for a family day of hands-on fun at Bowling Green State University (rain or shine) featuring a free lunch, take-home STEM activities, and everything from giant bubbles to giant worms. You won’t want to miss it!

STEM in the Park will feature interactive displays created by university departments and community partners to engage children of all ages in science, technology, engineering, and mathematics.

While at STEM in the Park 2011 enjoy activities and information provided by:

Bowling Green State University
Bowling Green Early Childhood Center
Challenge Learning Center of Lucas County
Edcouching
E.S. Wagner Co.
Fortmills: Ohio War of 1812 Battlefield
Heidelberg University
Imagination Station
Kuhlman Corporation
Lourdes College & Valentine Theater
Lucas County Soil and Water Conservation District
MVHS - Wolcott House Museum Complex
New York Life Insurance Company
NEDET
Ohio Northern University
Owens Community College – STGES
PNC Bank
PVS Nolwood Chemicals
Rain Garden Initiative of Toledo - Lucas County
Scrap4Art
Sauder Village
Scrap4Art
The Toledo Zoo
The University of Findlay
Toledo Area Metroparks
Toledo Botanical Garden
University of Toledo – American Chemical Society
West Side Montessori
Wood County Historical Center & Museum
Wood County Hospital
Wood County Park District
Wood County Soil and Water Conservation District

FREE Lunch catered by Tony Packo’s from 11 am - 1 pm (while supplies last)

Sponsored by:

BGSU

Visit the website for more info at www.nwocenter.org/STEMinPark

Newspaper Advertisement: Toledo Parent Magazine Aug. 15, 2011
Appendix I: USE-IT III Recruitment Email

USE-IT
Uniting Science Education, Inquiry and Technology

ABOUT USE-IT III:

USE-IT III is a professional development program designed to enhance the teaching of science, technology, engineering, and math (STEM) in Ohio public schools. The program is funded by the United Science Education Foundation and is administered by the NW Center for Excellence.

USE-IT III also provides participants with access to the latest research and best practices in STEM education, as well as opportunities to network with other educators.

WHO SHOULD ATTEND:

Teachers, administrators, and other education professionals interested in improving STEM instruction in their schools.

WHAT YOU WILL LEARN:

- Strategies for integrating STEM into existing curricula
- Techniques for incorporating hands-on, inquiry-based learning into STEM lessons
- Tools and resources for facilitating student engagement and collaboration

WHO CAN ATTEND:

Teachers, administrators, and other education professionals interested in improving STEM instruction in their schools.

WHEN:

USE-IT III workshops will be held on the following dates:

- October 2012
- January 2013
- March 2013
- April 2013

WHERE:

The workshops will be held at various locations throughout Ohio.

HOW MUCH DOES IT COST?

The cost of attending USE-IT III workshops is $999 for non-members and $950 for members.

Registration opens on September 1, 2012, and closes on October 15, 2012.

FOR MORE INFORMATION:

Contact the USE-IT III program coordinator at 800-555-5555 or USE-ITIII@nwcenter.org.

NWO CENTER FOR EXCELLENCE

The NWO Center for Excellence is committed to improving education and workforce development in Northwest Ohio.

For more information, visit www.nwoe.org.