ANNUAL REPORT 2016





STEM in the PARK™

Science, Technology, Engineering, and Mathematics

BGSU

NWO

Northwest Ohio Center for Excellence in STEM Education

Prepared by the Northwest Ohio Center for Excellence in STEM Education

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What is STEM in the Park?

STEM in the Park was created to enrich participants in the STEM (science, technology, engineering and mathematics) fields through hands-on, STEM-infused activities. STEM in the Park is coordinated and implemented by the Northwest Ohio Center for Excellence in STEM Education (NWO) at Bowling Green State University (BGSU). With a mission to advance STEM education for people of all ages, NWO annually presents this program free of charge to thousands of participants from Ohio and beyond.

The goals of STEM in the Park are to improve participants' knowledge and interest in STEM and STEM careers and to increase awareness of STEM related organizations and events in our community. These goals are met by featuring more than 150 interactive STEM activities facilitated by volunteers from high education institutions, preK-12 educational agencies, community non-profit organizations and local businesses, all who share the common goal of advancing STEM education.

STEM in the Park unites area families, teachers, university faculty and students, local businesses and community resource providers to engage in a free program of inquiry-based STEM activities and STEM career exploration through a local university experience, in hopes of inspiring a new generation to interact with the STEM disciplines. Additionally, STEM in the Park seeks to contribute to STEM Education by providing opportunities for children and adults to explore the many aspects and application of STEM in their daily lives.

The seventh annual STEM in the Park event was held on the campus of Bowling Green State University on September 24, 2016. The attendance once again increased and was the largest to date with 4,760 attendees/exhibitors/staff/volunteers participating, which is a remarkable increase from 2015. The past year's event also grew from over 140 to 163 activity stations, with many new exhibitors and stations facilitating multiple hands-on STEM activities, including the creation of two new activity stations: The H_2O Zone, which explored the science behind water's amazing uses, and The Food Science Zone, which demonstrated the science involved in nutrition and cooking.

2016 STEM in the Park by the Numbers

Total Participants: **4,760**

Expected 2017 Attendance: **5,000**

Hands-On Activities: **163**

Event Volunteers: **1,076**

Sponsors: **28**
(Corporate, BGSU, In-Kind)

One of the many strengths of this program is the spirit of community that evolves during its planning and implementation. The many volunteers/exhibitors that provide free STEM- infused and inquiry-based learning activities to engage children and their families contributes to the remarkable success of STEM in the Park. As well, many exhibitors state that participation in STEM in the Park is a worthwhile experience and is beneficial for their organization.

The 2016 STEM in the Park event was presented by BGSU, BP, First Solar, Lubrizol, PPG Industries and Verizon with community support from the BGSU Foundation, Carolina Biological, Perrysburg Rotary Club, Spectra, Thayer, SSOE and The Anderson's. General Sponsors included AT&T, Biggby Coffee, Bostdorff's Greenhouse, Bowling Green Community Foundation, Costco, Environmental Water, Food for Thought, Giant Industries, Kroger, Lowes, Master Chemical, Home Depot, Walmart and Tony Packo's.

Who Comes to STEM in the Park?

A total of 4,760 people including volunteers and exhibitors attended STEM in the Park in 2016, which is an increase from the previous year. Overall, the growth in attendance has been remarkable since the event's first year in 2010.

STEM in the Park Attendance from 2010 to 2016

Year	2010	2011	2012	2013	2014	2015	2016
Total Attendance	*1,614*	*1,711*	*2,681*	*3,287*	*3,850*	*4,373*	*4,760*

We love this awesome free event! It is wonderful for children and something I am very proud takes place in our community. I love the amount of participation from colleges and local companies. Plus who doesn't love some free Tony Packos!

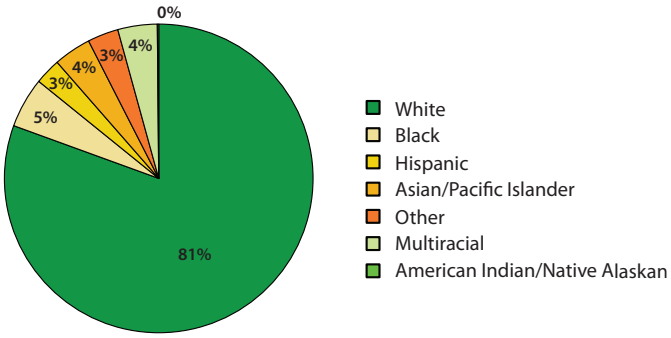
Fantastic, the kids love it, and it seems to get better every year.

Part of the Northwest Ohio Center for Excellence in STEM Education (NWO) mission is to stimulate the interest of underrepresented students to the rewarding fields of STEM. Transportation grants were offered to students, and in some cases their families, to attend STEM in the Park, as in many cases the lack of transportation was a barrier of attendance. These grants have been provided for the last four years to area schools and organizations. In 2016, students/families were transported to the event from Toledo Public Schools, Sandusky City Schools, Otsego Schools, Lima City Schools, and the Adelante Latino Community Center in Toledo, OH.

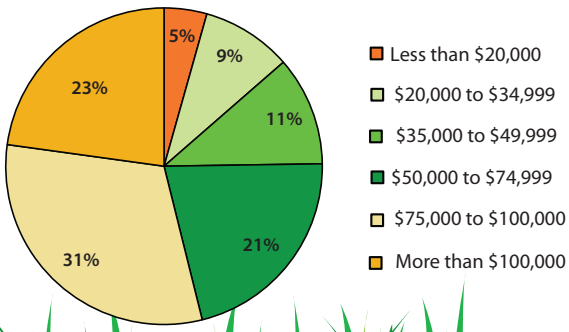
The staff of STEM in the Park will remain committed to expanding the transportation grant program even further in our region for the 2017 event.

The demographic information collected from the registration and evaluation survey is presented in figures below.

Ethnicity Identity of People Attending STEM in the Park (n=2,010)



Annual Household Income for Families Attending STEM in the Park (n=206)



STEM in the Park Activity Highlight

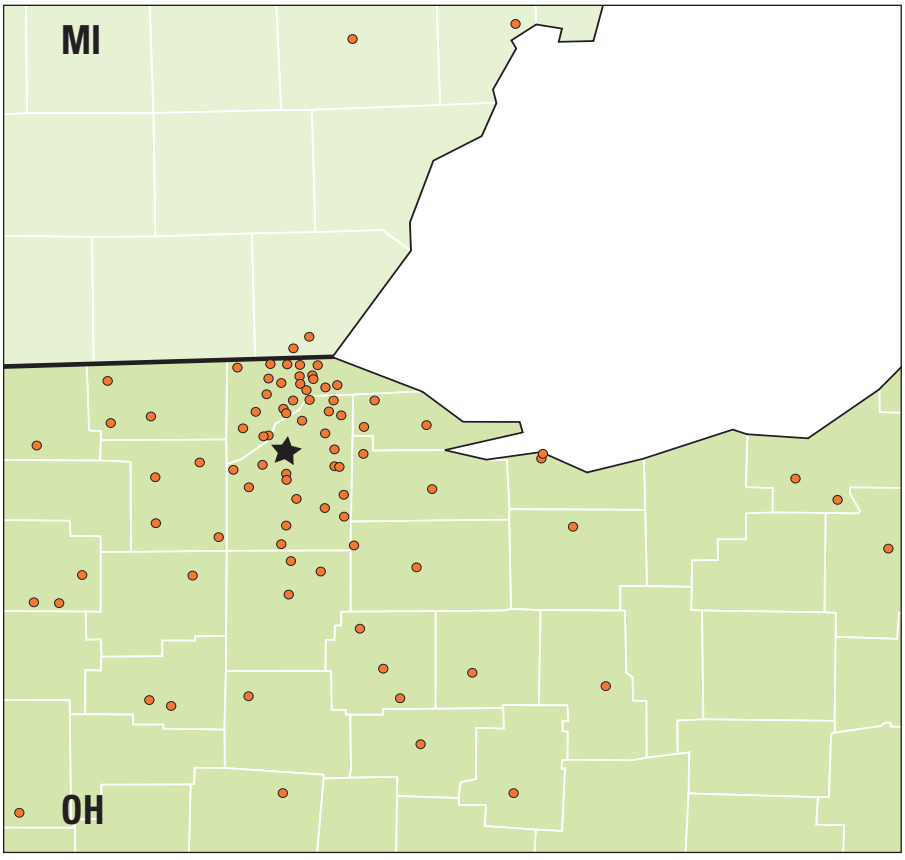
Butterfly Larva Necklaces

This activity station, facilitated by the *BGSU School of Teaching and Learning Adolescent and Young Adult Program*, continues to be a top favorite activity among attendees who complete the evaluation survey. Children visiting this station built a caterpillar habitat in a small container, which they wore around their neck for the rest of the event. Children were given instructions for taking care of their caterpillar at home as it formed a chrysalis. Weeks after the event, hundreds of butterflies emerged from their chrysalises in hundreds of homes and released in the environment in northwest Ohio and southeast Michigan!

Where Are The Families Coming From?

As in years past, word about STEM in the Park reached an increase of cities and towns throughout the region of northwest Ohio and southeast Michigan.

Participants and families came from 119 difference cities and towns. Most participants were from northwest Ohio and the nearby towns of Bowling Green, Toledo, and Perrysburg. Some participants also come from the Columbus and Cincinnati areas as well as from several cities and towns in southeast Michigan. The map below illustrates the locations from which participants traveled to STEM in the Park.



★ STEM in the Park (Bowling Green, OH)

What an amazing event! I was so impressed. All three of my children ages 3 to 8 were engaged and had a blast! Lunch was awesome as well!

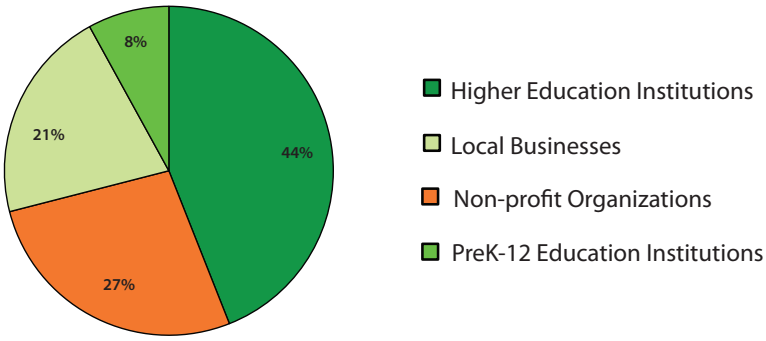
We really enjoyed it and have the last few years. We love doing STEM activities at home and this is a great way to go out and see/learn new activities as well.

What Do People Do at STEM in the Park?

For the 2016 event, STEM in the Park featured 163 STEM-infused activities that were facilitated by local exhibitors from local businesses, non-profit organizations, pre-K-12 community organizations, and institutions of higher education. All activity stations included hands-on STEM activities and games, and provided participants with opportunities to observe and interact with several kinds of artifacts, animals, animal coverings, earth materials and different forms of technology. Many of the activity stations include make and take activities that resulted in materials that participants could take home. These included ice cream, butterfly larvae necklaces, personalized concrete stones, bubble bath fizzies, and many more. Many stations also provided take away STEM activity cards to extend learning at home. Activity cards can also be accessed online at www.bgsu.edu/nwo/programs/stem-in-the-park/activity-cards.html.

The figure below illustrates the percentage of STEM activity stations facilitated by each type of exhibitor.

2016 STEM in the Park Exhibitors



The following three pages highlight the map that visitors received at the event to assist in the navigation of the exhibitors and their activity stations.

STEM in the Park Activity Highlight

BG Foam Home
An Extreme Bubble Experience

Brand new this year was a 10'x10' area foam bubble 'pit'! *Spark! Learning of Perrysburg* took bubbles to the extreme! Visitors didn't mind getting 'messy' and covered with foam as the Foam Blaster 3000 Cannon provided a pool of foam bubbles for children (& adults!) to play in. This was truly an amazing sensory experience for learners of all ages! Visitors also had the opportunity to make their own bubble foam in smaller amounts to explore.

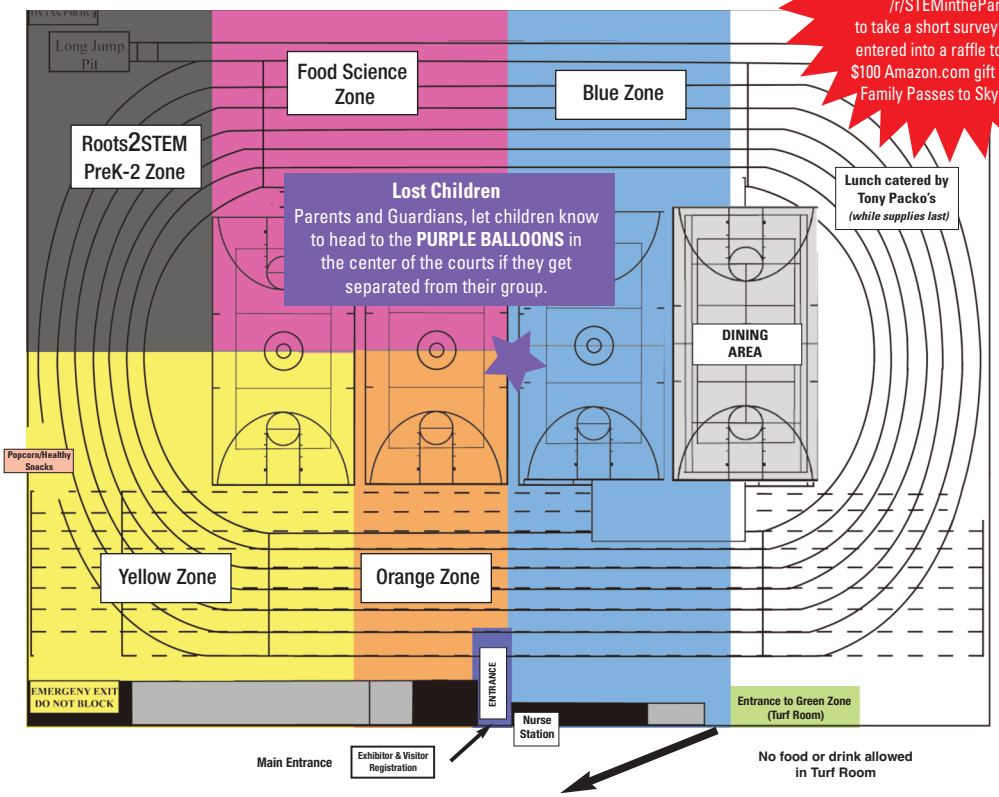
Map visitors used at the event

STEM in the PARK™
Science, Technology, Engineering, and Mathematics

Let's get trending @NWOSTEM
Include #GetyourSTEMon
on all of your posts!

Please take five minutes to tell us what you thought of **STEM in the Park**.

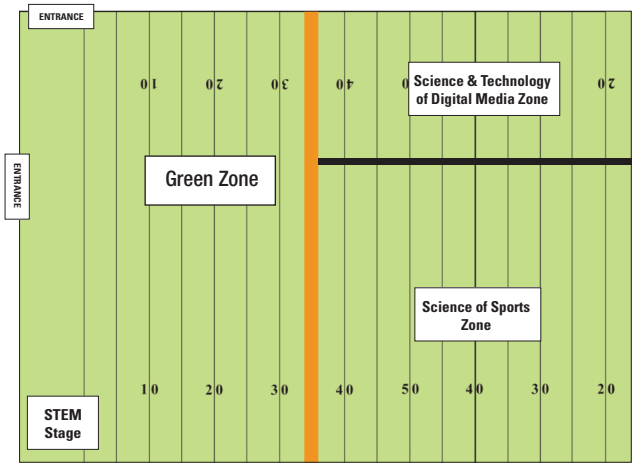
Visit: https://www.surveymonkey.com/r/STEMinthePark to take a short survey and be entered into a raffle to win a $100 Amazon.com gift card or Family Passes to SkyZone!



Indoor STEM Stage Schedule:
10:30 a.m. - Imagination Station - Ballplosion
11:00 a.m. - Toledo Zoo & Aquarium - Soar & Explore
11:30 a.m. - Imagination Station - Elephant's Toothpaste
12:00 p.m. - Toledo Zoo & Aquarium - Soar & Explore
12:30 p.m. - Imagination Station - Ping Pong Ball Shooter
1:00 p.m. - Toledo Zoo & Aquarium - Soar & Explore
1:30 p.m. - Imagination Station - Giant LN2 Cloud

Outdoor Performance Schedule:
10:00 a.m. - Taiko Drumming
12:00 p.m. - Ten40
12:30 p.m. - AccousChicks
1:30 p.m. - Not Yet Perfect

BGSU Falcon BEST at the BGSU Ice Arena
Come watch local high school teams run their homemade robots on BG's "farm."



ZONE	ACTIVITY PROVIDER	ACTIVITY STATION
Blue	American Chemical Society - Toledo Local Section	On Your Mark, Get Set, and EXPERIMENT with Chemistry Fitness Fun
Blue	ONU University Education	The Science of Drug Addiction
Blue	Bowling Green Council of Teachers of Mathematics (BGCTM)	Beach Balls and Math
Blue	BGSU Department of Physics & Astronomy	Bubbles: Phun with Physics
Blue	Bowling Green Science Education Council (BGSEC)	Rainbow Density Tubes
Blue	HackBG	Learn to Code
Blue	Imagination Station	Slime
Blue	Kappa Delta Pi: International Honors Society for Educators	Volume Victory
Blue	Lubrizol and the BiG Fab Lab	The ElecTRAIN
Blue	Saturn V Education	Pop Rockets
Blue	Technology First	VEX Robotics
Blue	Toledo Technology Academy	Running Robots
Blue	University of Toledo-SCOPE Program	Microscopes and More
PreK-2	BGSU Early Childhood Organization	Exploring Science through Senses
PreK-2	BGSU Inclusive Early Childhood Science	Roller Coaster Fun
PreK-2	BGSU Martha Gesling Weber Reading Center	Once Upon a STEM
PreK-2	BGSU School of Teaching & Learning AYA Science Education	Butterfly Larva Necklaces
PreK-2	BGSU Tau Beta Sigma	Making Memories with Music
PreK-2	Robinson Elementary School, Toledo Public Schools	Monarch Butterfly Gliders
PreK-2	Science & Math Education in ACTION at BGSU	H_2O in ACTION
PreK-2	Toledo Botanical Garden	A Worm's Eye View
Outside	BGSU Admissions	Learn about BGSU - Take a Campus Tour
Outside	BGSU Department of Physics & Astronomy	Solar Fun
Outside	BOSEF (Building Ohio's Sustainable Energy)	Solar Powered Boats
Outside	Bowling Green Fire Division	Life on a Fire Engine
Outside	E.S. Wagner Company	Big Digger
Outside	ERG Environmental Services	Rippin and Recycling Computers
Outside	Food For Thought	Mobile Food Pantry (Drop off donations here)
Outside	Toledo Metroparks	Stepping on STEM & Take Aim! Archery
Outside	UT-MISSION EARTH	GLOBE Citizen Science - Take a Look at the Clouds!
Outside	Verizon	The C.O.L.T. (Cell On Light Truck)
Outside	Wood County District Public Library	Bookmobile & Electric Snap Circuit Play
H_2O ZONE		
Outside	BGSU Early Childhood Science	Wet & Wild
Outside	BGSU School of Earth, Environment and Society	What's In your Watershed?
Outside	BGSU Women's Swim and Dive	Slip 'n Slide Races
Outside	Bishop Hoffman Catholic School	Keep the "Wind in Your Sails"
Outside	Bowling Green Early Childhood Learning Center Montessori	Sink and Float FUN
Outside	Gathering Volumes Bookstore	Make a Water Blaster (Sign-up at table - limited spots available)
Outside	Greater Cleveland Aquarium	Underwater Exploration
Outside	Great Lakes Science Center	Stay Curious
Outside	Maumee Valley Historical Society	What Floats Your Boat?
Outside	Spark! Perrysburg	BG Foam Home!! - An Extreme Bubble Experience
Outside	St. Ursula Academy	Save the Soil
Outside	Toledo Lucas County Rain Garden Initiative	Root of it All
Outside	Wood Soil & Water Conservation District	Rain Gutter Regatta
FOOD SCIENCE ZONE		
Magenta	Anthony Wayne FFA	STEM in Agriculture
Magenta	BGSU ACS-SA	Chemistry of Ice Cream
Magenta	BGSU Department of Public & Allied Health	Fun with Food & Nutrition: MyPlate Game
Magenta	BGSU Dining Services	The Magic of Popcorn
Magenta	BGSU School of Intervention Srvs.-Inclusive Early Childhood Ed.	Physics with S'more Science
Magenta	BGSU Student Nutrition Association	Nutrition is our Mission
Magenta	Food For Thought	Urban Gardening and Reducing Waste in Food Consumption
Magenta	Grow Next Gen and the Ohio Soybean Council	The Science of Flavored Milk
Magenta	Kids' Tech University @ BGSU	Why Does My Fruit Turn Brown?
Magenta	Nutrients for Life Foundation	What Does Your Seed Need To Grow?
Magenta	ONU CPFI/Pharmacy	Good vs Bad: Food Edition
Magenta	Sylvania Historical Village	Science in the History Kitchen

ZONE	ACTIVITY PROVIDER	ACTIVITY STATION
Yellow	BG Insurance Group	Child Safety ID
Yellow	BGSU Biology Graduate Student Association	The Five Senses
Yellow	BGSU Firelands	Gross Anatomy and Histology
Yellow	BGSU Herpetarium - Department of Biological Sciences	Reptiles are Cool
Yellow	BGSU Marine Biology Association	Water World Creatures
Yellow	First Solar	Solar Energy and You
Yellow	Lourdes University Early Childhood Education	Edible DNA
Yellow	Sauder Village	What Came First, The Chicken Or The Egg?
Yellow	Sylvan Learning	LEGO® Robotics
Yellow	Team Family Coaching/The SpOiled RN	Social Emotional Intelligence
Yellow	Thayer Family Dealerships	Build Your Own Car
Yellow	Xcite Learning	Kitchen Chemistry Bath Fizzy's
Orange	AT&T	Virtual Reality Driving Simulator
Orange	Horizon Science Academy of Toledo	Horizon Jaguars STEM in Robotics
Orange	SSOE Group	Build a Motor
Orange	Therapy Dogs International, Chapter 122	Pet a Therapy Dog
Orange	Verizon	Internet of Things/Indy Car
Green	AIMS (Academic Investment in Math and Science)	Chromatography Butterflies
Green	BGSU Aviation/Alpha Eta Rho	Up, Up, and Away! Fly an Airplane Simulator
Green	BGSU Curriculum Resource Center/University Library	How Do Gears Work?
Green	BGSU Department of Architecture and Environmental Design	Architecture: Art or Science? What do you think?
Green	BGSU Department of Engineering Technologies	"Lady Bug" Robot
Green	BGSU Department of Geology	Fun with Fossils! & Weathering & Soils
Green	BGSU Middle Childhood Science	Parachute Drop
Green	Costco Wholesale	Math Puzzles Fun
Green	Challenger Learning Center of Lake Erie West	Mars, Stars and More
Green	BOSEF (Building Ohio's Sustainable Energy)	Building Ohio's Sustainable Energy Future
Green	Lourdes University, Dept. of Chemistry and Physical Sciences	Static Electricity
Green	Maumee Valley Country Day School	Zippin' with the Hawks
Green	Mercy College	What is Blood Pressure? How Do Your Lungs Work? Fun with Physics
Green	Nature's Nursery	Native Animal Activities
Green	New York Life	Child ID Station
Green	Ohio Northern University Raabe College of Pharmacy	Organ Donation Awareness
Green	Ohio Sea Grant and Stone Laboratory	An Invert Investigation
Green	Ohio Virtual Academy/Insight School of Ohio	Toad Abodes and Frog Flats
Green	The University of Findlay-Biology	Animal Adaptation
Green	The University of Toledo - UT StACS	Fingerprint Forensics
Green	Toledo Zoo	Amazing Animals
Green	Wood County District Public Library	Computer Coding
Green	Wood County Hospital	Camp Cootie ~ Kids Hand Hygiene
Green	Wood County Park District	Science of Nature
SCIENCE OF SPORTS ZONE		
Green	About Golf/ BGSU Women's Golf	Golf Simulator - Take a Swing
Green	BGSU Cross Country & Track/Field	Hurdling and Relay Racing
Green	BGSU Gymnastics	Balance & Bend - Gymnastics Physics
Green	BGSU Women's Basketball	Better Basketball Shooting
Green	BGSU Women's Swim and Dive	How to Train Like a Champion
Green	Toledo Football Academy	Soccer Kick Speed
Green	Verizon	Baseball & Soccer Technology
SCIENCE AND TECHNOLOGY OF DIGITAL MEDIA ZONE		
Green	BGSU Department of Visual Communication Technology	Digital Imagery
Green	BGSU School of Earth, Environment and Society	SPatial LITeracy - SPLIT Remote Sensing
Green	BGSU Digital Arts	Animation Station, Virtual Reality, & Digital Printing
Green	Verizon	Virtual Worlds Goggles
STEM STAGE		
Green	Imagination Station	Ballplosion, Elephant's Toothpaste, Ping Pong Ball Shooter & Giant LN2 Cloud
Green	The Toledo Zoo	Soar & Explore

STEM in the Park Activity Highlight

Attendees' Top 10 Favorite Activity Stations at STEM in the Park 2016

Activity Station (Provider)
STEM Stage (The Toledo Zoo and Imagination Station)
Butterfly Larva Necklaces (BGSU School of Teaching and Learning AYA Science Education)
Virtual World Goggles (Verizon)
Reptiles are Cool (BGSU Herpetarium – Department of Biological Sciences)
Animation Station, Virtual Reality, and Digital Printing (BGSU Digital Arts)
Amazing Animals (The Toledo Zoo)
BG Foam Home – An Extreme Bubble Experience (Spark! Perrysburg)
Running Robots (Toledo Technology Academy)
Soccer Shot Speed (Toledo Football Academy)
Digital Imagery (BGSU Department of Visual Communication Technology)

Activity station descriptions are highlighted throughout the report.

Love the program, we return every year even though my child is now in high school. This year, she could talk to the chemistry students who were able to understand what she knew and how they could add to her knowledge or show her an example of what she was learning.

Keep doing what you do!

Reptiles Are Cool

The *BGSU Department of Biological Sciences Herpetology Lab* facilitated this station. Attendees who visited this station had the opportunity to observe and interact with more than two-dozen different species of reptiles under the guidance and supervision of several BGSU students who volunteer in the herpetology lab. Some of the reptiles at this station included crested geckos, bearded dragons, corn snakes, Kenyan sand boas, and a six and a half foot long albino boa constrictor!

STEM in the Park Activity Highlight

Amazing Animals

The *Toledo Zoo* engaged visitors to explore survival! Through games, activities and preserved animal pieces, participants discovered adaptations from around the world and how these traits aid animals in finding food and staying alive. Live animals such as lizards, armadillos, and hissing cockroaches, were present to enhance the experience and reinforce how diverse and important adaptations can be.

What Are People Saying About STEM in the Park?

The results of an evaluative survey of participants indicated most participants believed STEM in the Park activities were highly engaging and positively impactful on children's interest in STEM.

> ***"Great event again! It just keeps getting better every year! The hands on activities are the best! I loved how the stations were more spread out then in years past. Food lines are getting more organized every year. Keep up the great work. This is the best family event in Northwest Ohio!"***

In addition, our exhibitors gave STEM in the Park high remarks within the survey and saw first hand how engaged participants were in activities.

> ***"What an amazing opportunity to share what we love to do! Through our activity station and demonstration times, we were able to showcase what is possible beyond the walls of our organization."***

> ***"We were able to engage hundreds of families in science activities and content while emphasizing that everyone can be a scientist! "***

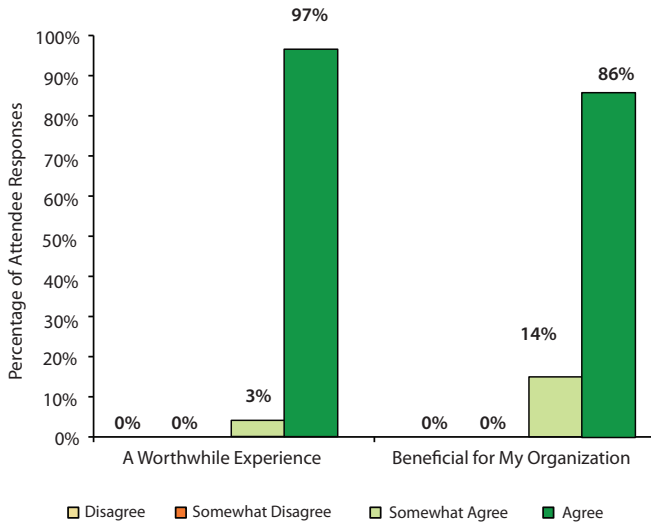
> ***"Inspiring science in children/people is always a worthwhile experience."***

> ***"It's always great being part of this event. There are a lot of great STEM opportunities out there and this is one way that we can show case. I also truly believe that collaborating with other community organizations is important as well."***

> ***"STEM in the Park was a terrific experience for our staff as we were able to educate and inspire children and their families about our animals and conservation on a much larger and grandiose scale than usual."***

Exhibitors also believed that participating in STEM in the Park 2016 was a worthwhile experience, and reported that being an exhibitor was beneficial for their organization (see table below). Almost all exhibitors said it is very likely that they will return as exhibitors to STEM in the Park.

Exhibitors' Perceptions Regarding the Value of their STEM in the Park Experience



Likewise, most participants indicated that it is very likely that they will attend with their family again next year.

Overall, the comments were very positive. Many respondents wrote how impressive the event was, and expressed their gratitude for free admission to such a high quality event, complete with free lunch. Respondents also mentioned how helpful and friendly the exhibitors and volunteers were during the event.

"We moved to Cincinnati last year and drove up just for STEM in the Park. It is well worth the trip."

STEM in the Park Activity Highlight

Animation Station

The *BGSU Digital Arts Department* featured digital printing transferring to a refrigerator magnet, stop motion animation, and virtual reality with Oculus technology. Participants had hands-on experiences with a transferring process to a magnet section in which they were able to take home. Visitors were also engaged in creating stop motion animations and played them digitally on-site after they finished them. At the virtual reality table, attendees were able to watch virtual reality animation and experience a variety of environments through wearing Oculus Rift goggles. Participants were able to get a true sense of the height of buildings and 3 dimensional objects in the environment.

STEM in the Park Activity Highlight

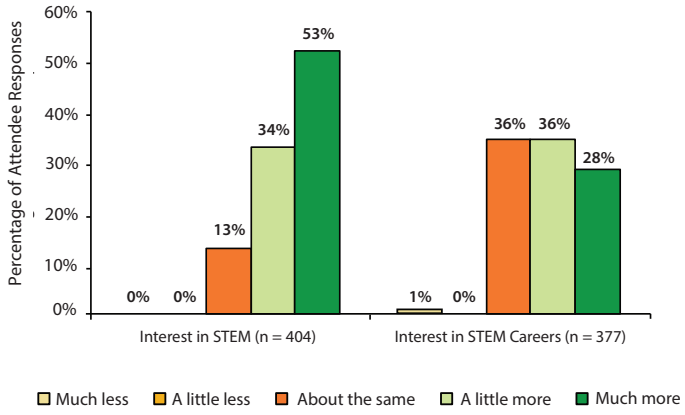
Digital Imagery

The *Visual Communication Technology* program at BGSU engaged participants with an interactive digital photography activity. Attendees were able to use a touchscreen interface to composite photographs of themselves into various environments and insert virtual props. A particularly popular environment included a giant *Tyrannosaurus Rex* attacking the kids! Other scenes included a beach, a mountain top, and outer space. But it was the digital props that the kids found most entertaining. They could really unleash their creativity - adding glasses, hats, and thought bubbles. When they had finished their composition, participants received a 4x6 print out and digital version in their inbox.

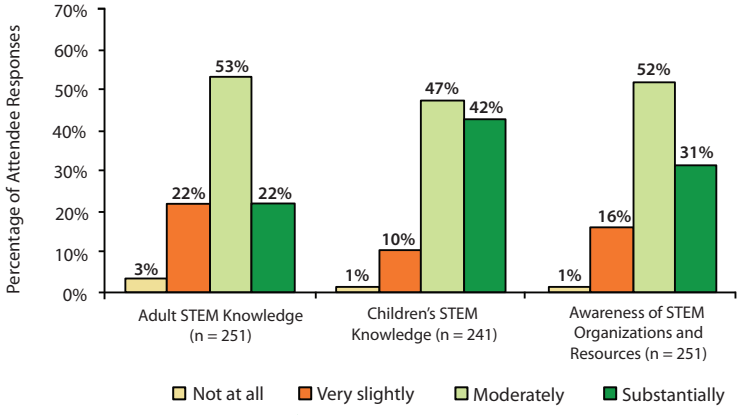
What is the Impact of STEM in the Park?

The findings from the 2016 STEM in the Park evaluative survey demonstrate that STEM in the Park successfully reached its goals of increasing participants' awareness of STEM related organizations and events in their community, and improving participants' knowledge about and interest in STEM and STEM careers. See graphs below:

STEM in the Park Impact on Children's Interest in STEM and STEM Careers



STEM in the Park Impact on Attendees STEM Knowledge and Awareness



How Do People Learn About STEM in the Park?

People learn about the event in several ways. NWO promoted the event on social media and sent emails to past participants, community STEM partners, higher ed faculty and prek-12 teachers and administrators. Postcards and flyers were also distributed to local schools and community partners Yard signs were distributed at key locations around northwest Ohio. WBGU-TV aired an interview with event organizers and exhibitors on the local PBS television station prior to the event that highlighted the unique aspects of the event, while inviting viewers to attend. Word of mouth also once again played an important role in the promotion of the event as some participants learned about the event through friends or family members.

It was well organized and easy to navigate. All the booths we visited were filled with friendly people who were excited to talk to us. The food was great and appreciated. The only drawback is the huge crowds but that isn't anything you can or should do anything about. :) That is just what one deals with when coming out to an event like this. It is overall a very enjoyable experience for all of us.

We love STEM in the park! It is a great community event which teaches kids and adults about different aspects of science. It is so easy to stay engaged and find something new to learn about. As a science teacher I greatly appreciate your efforts to get children excited and curious about various fields of science. Thank you!

STEM in the Park Activity Highlight

Running Robots

At *Toledo Technology Academy's* Running Robots station visitors remotely controlled VEX robots to compete in a friendly game. Participants used the robots to carry, push, or drag an object into a scoring area to score a point. Opposing robots attempted to block the robot attempting to score. In addition, participants designed and created their own pin-on buttons with their own personalized artwork which they were able to take home. The Toledo Technology Academy is a 7th-12th magnet school in the Toledo Public Schools system. It is a College Tech Prep School that integrates rigorous academics with the Engineering & Science Career Technical Course of Study.

STEM in the Park Activity Highlight

How are Participant Suggestions About STEM in the Park Addressed?

Every registered guest who comes to STEM in the Park receives an email with the opportunity to respond to questions pertaining to their experience at the event. The survey offers a few open-ended questions such as, "Please tell us about your experience with STEM in the Park in your own words," and "What suggestions do you have to improve the event next year?" The STEM in the Park team takes time to read and consider this feedback, which is highly valued.

Soccer Shot Speed

Visitors to *Toledo Football Academy's* Soccer Shot Speed activity station measured their kicking power of a soccer ball. Participants were able to take turns striking a 'smart soccer ball' with the speed measured by both a radar gun and data collected from an implanted chip in the ball. This chip connects via Bluetooth technology and measures power, spin and trajectory through its connection to a cell phone app. From this information, participants are able to understand and improve upon their kick velocity and overall mechanics with each attempt to compete for the highest shot speed.

What an incredible event! As a mother and teacher I appreciate all of the time and thought that goes into this educational event. We love going and highly recommend it to everyone. We always bring home fun ideas to do at home. I also love seeing new ideas to incorporate into my classroom. Thanks, BGSU for such a great day!

I was very impressed with how well the event was laid out. Very easy to get to the different stations, even with the crowds.

New and Expanded STEM Features in 2016

Each year, the event organizers continue to add to the array of STEM exhibitor stations with new and different amazing STEM activities. This year was not any different, and new activities (in addition to past favorite activities being repeated), brought the total to 163 different STEM activities for participants to enjoy. Two new activity zones were added, and the Science and Technology of Digital Media Zone and the Science of Sports Zone were expanded:

1. **H_2O Zone:** This area explored the science behind the many uses of water in our lives. A few of the hands-on activity stations were: 'What Makes Soap Foam?', 'Save the Soil', 'An Extreme Bubble Experience', 'What's in Your Watershed?', and 'Rain Gutter Regatta'.

2. **Food Science Zone:** This zone investigated the science involved with agriculture, nutrition and cooking. Some of the Food Science activity stations were: 'Chemistry of Ice Cream', The Magic of Popcorn', 'Why Does My Fruit Turn Brown?', Urban Gardening', and 'Science in the History Kitchen-Churning Butter'. The Food Science Zone was sponsored in part by Food For Thought whose mission is to educate the community on food insecurity along with nutritious meal preparation. They provide food/meals to thousands in the surrounding Toledo area and had their mobile food pantry at the event for attendees to make contributions.

3. **Digital Media Zone:** Due to its popularity in 2015, this zone was expanded to explore many aspects of digital media. Verizon was a sponsor of this zone and provided the activity station, 'Virtual Worlds Goggles' which was one of the Top 10 favorite activity stations. Other activity stations included, 'Digital Imagery', 'Animation Station', 'Digital Printing', and 'Remote Sensing'.

4. **Science of Sports:** This zone continues to be one of the most favorite as BGSU athletes interact with the visitors and engage children in activities such as, 'Hurdling and Relay Racing', 'Gymnastics Physics-Balance and Bend', 'Better Basketball Shooting', and 'Soccer Shot Speed (with a Smart Soccer Ball)'. New this year was a huge Golf Simulator sponsored by About Golf and BGSU Women's Golf Team (the adults really loved the competition aspect of this activity station!).

5. **The STEM Stage:** This highly engaging stage showcased the best of The Toledo Zoo and Imagination Station and kept visitors entertained with eye-popping interactive demonstrations and amazing and unique animals. The Toledo Zoo show 'Soar and Explore' featured large rare birds (which took flight!), a sloth, and an enormous lizard. Imagination Station amazed the audience with four high energy demonstrations: 'Ballplosion', 'Giant LN2 Cloud', 'Elephant's Toothpaste', 'Ping Pong Ball Shooter'.

This year 163 engaging hands-on activity stations were featured in 2016 including Solar Powered Boats, Build a Motor, Toad Abodes & Frog Flats, Rocket Power!, StarLab Planetarium, Kitchen Chemistry Bath Fizzy's, Computer Coding, and Edible DNA. A complete list of Activity Stations is provided on pages 7-8. The TOP 10 Activity Stations List is on Page 9 as well as highlighted throughout the report.

STEM in the Park Activity Highlight

Virtual Worlds Goggles

In this activity station, sponsored by *Verizon*, visitors had the opportunity to be immersed in two different virtual experiences.In the first experience, visitors immersed themselves in a variety of interactive demos controlled with motion controlled head mounted goggles. They were able to explore distant lands, take flight, interact with creatures real and mystical, as well as play games where they were the joystick!

The second experience focused around how virtual reality is created. Here visitors learned how to translate real world experiences into virtual ones. Through the use of smartphones and tablets visitors received hands-on experience controlling 360° cameras that captured fully immersive photos and videos!

Social Causes

In 2015, NWO partnered with Food For Thought (FFT), a local non-profit organization that collects food and household items and distributes them to families in need in northwest Ohio. In 2016, participants were encouraged to once again bring food and household items to donate to the mobile pantry which FFT brings to the event. In addition to attendee donations, all remaining nutritious snacks and water bottles from the event were donated to Food For Thought.

Food For Thought increased their participation in 2016 by hosting several activity stations in the Food Science Zone in addition to bringing the Mobile Food Pantry. With a mission to educate the community on food insecurity along with nutritious meal preparation they provided hands-on approaches to Urban Gardening (visitors constructed a vertical garden device out of empty 2-Liter bottles, string, soil, and seeds) and Reducing Waste in Food Consumption. Visitors were also able to assemble balanced meal food boxes that were then distributed to identified families in need in the community.

For more information on Food For Thought, please visit their website: **http://feedtoledo.org/**

STEM in the Park staff will continue to connect the event to a social cause, and is grateful for the opportunity to do so.

What Are the Future Plans for STEM in the Park?

The event organizers always look for ways to make improvements and consider participant suggestions and feedback for enhancing the STEM in the Park experience. Based on this participant feedback, the STEM in the Park staff plan to consider the following changes for the 2017 event:

- Enhance the On-Site Registration Process to be more efficient and add a separate entrance for Pre-Registered Guests.
- Extend the time of event.
- Work with the lunch provider (Tony Packo's) to ensure a quicker, more efficient lunch process.
- Create a Quiet Zone/Room for children who are over-stimulated and need a 'break' from the action.
- Continue to offer new zones and activities but also bring back the most popular activity stations.

STEM in the Park Activity Highlight

STEM Stage

Imagination Station

Visitors were amazed by a variety of over-the-top shows presented on the STEM Stage! From engineering to chemistry, *Imagination Station* touched on a variety of STEM-related topics. They started by discussing the properties of liquid nitrogen and then used the subzero substance to launch hundreds of play balls more than 30 feet into the air. Reserving thirty liters of liquid nitrogen, they also created a giant cloud… indoors! Other visitors witnessed the catalytic decomposition of hydrogen peroxide, which resulted in three 8-foot tables being filled with foam in less than one minute. And finally, for an 'at home' spin, *Imagination Station* shared their prototyping process and allowed one lucky visitor to rapidly fire ping pong balls into a bucket held by her dad! From the kitchen to the classroom, science can happen anywhere and it is *Imagination Station's* mission to spark that passion for learning.

The Toledo Zoo

The *Toledo Zoo* presented the "SOAR & EXPLORE" Live Animal Show. During the presentation, the audience, which encompassed all ages were able to learn and observe a combination of free flying birds like "Sur" the Black Vulture as well as our mammals with some amazing adaptation like "Cindy Lou" our Anteater.

After the show, the audience was able to get an even close look at the animals and take up-close pictures of them and ask question to the *Toledo Zoo* Animal Trainers.

Northwest Ohio Center for Excellence in STEM Education

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Our family (adults and children) have looked forward to STEM in the Park ever since we first became aware that it existed upon moving to the area. We love all of the activities and shows and the free lunch/coffee is such a fantastic bonus for attending parents. If we have one complaint, it would be that it doesn't last longer because our children have been disappointed each year that they couldn't make it to every single thing... they love it that much.

I loved seeing all the people helping kids get excited about math, science, and technology! It was great to see! I must admit that the free food convinced me to check it out and I am so glad I did! I will be bringing my child back again!