

*Advancing science, technology, engineering, and mathematics education for people of all ages.*



December 2024

## What's happening at NWO?

In late November, a group of students from Washington Local Schools enjoyed a daylong Campus Experience on the campus of Bowling Green State University. Through Project EDUCATE the students, who are interested in teaching careers, learned about BGSU's Virtual Simulations

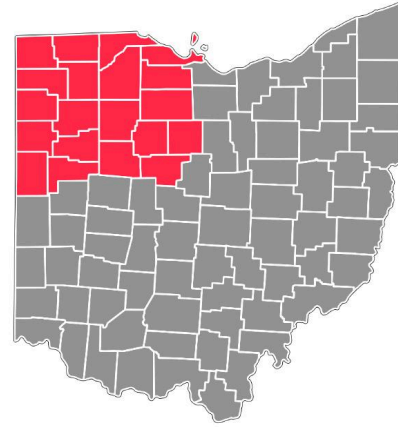


Laboratory and how it works in the classroom. Through the Project EDUCATE (**E**ducators of **D**iversity: **U**nified and **C**ollaborative to **A**spire **T**eacher **E**ducation) grant project, the students, who are interested in teaching careers, learned about BGSU's Virtual Simulations Laboratory and how it works in the classroom.

## K-16 STEM in the NEWS

**NWO Earns Continued Distinction as Hub of Ohio STEM Learning Network**

The Northwest Ohio Center for Excellence in STEM Education (NWO) at Bowling Green State University's (BGSU) College of Education and Human Development earned the distinction of operating for the sixteenth year as one of the seven "hubs" in the state by the Ohio STEM Learning Network of Battelle. The network operates as a public-private partnership between the [Ohio Department of Education](#) and [Battelle](#).



With a mission to advance STEM education for people of all ages, NWO has been serving the STEM education needs of northwest Ohio since 2002, and since 2008 has operated as an OSLN hub, championing STEM education initiatives together and driving impact. NWO is a partnership among area universities and colleges, pre-K-12 schools, educational service centers, and local businesses that share a similar mission.



"We are thrilled with this continued support," said Dr. Emilio Duran, faculty in the BGSU School for Inclusive Education of EDHD and Director of NWO. "Over the years we've worked to provide enriching STEM experiences for all learners with a focus on hands-on and minds-on learning, and OSLN has been a great and long-term supporter of our mission and work across the region of northwest Ohio."

Dr. Duran went on to state that NWO strives to accomplish its mission through STEM educator professional development, school and community outreach and various grant projects and initiatives. In addition, NWO coordinates several events, including the annual "Women in STEM" event on the BGSU campus, drawing over 350 6<sup>th</sup>-8<sup>th</sup> grade students each year to engage in inquiry based and hands on STEM activities. Other events include the STEM Inquiry Series of professional development, BioBlitz, and GLOBE Student Research Symposium. More detailed information on these events and other NWO programs can be found [here](#).

The Ohio STEM Learning Network, through its seven hubs across the state, is committed to helping the State of Ohio inspire and train the next generation of innovative leaders. STEM and STEAM schools are designated by the Ohio STEM Committee, which is supported by the Ohio Department of Education and advised by the Ohio STEM Learning Network.

OSLN also leverages existing STEM schools and programs to spread effective practices and tools across the state and the nation.

After Battelle started Ohio's first STEM school in 2006 (Metro Early College High School), the state recognized the value in providing this STEM education experience to students across Ohio. Two years later, the state budget allocated \$13 million in funding to establish STEM schools and programs in Ohio. Battelle contributed an additional \$17 million to launch the state network (OSLN) and support to seven hubs. For more than a decade, STEM-designated schools have led the charge in creating partnerships with local businesses, creating work-based learning experiences for Ohio students. Local schools, industries and communities noticed. The first five STEM schools in Ohio have grown to over eighty designated schools today, six of which are in the northwest Ohio region of NWO. "It is important to note that the STEM designation process is a transformative one, the entire school staff is committed to building and maintaining an innovative STEM culture that lends itself to students learning in an inquiry based and supported environment," stated Susan Stearns, Assistant Director of Programming and Development at NWO and co-director of the OSLN Hub at BGSU. "It is our hope that more and more schools in our region will seek quality STEM educational programming and participate in our events and programs as it is critical to the success of the state of Ohio," Ms. Stearns remarked.

More information on the Ohio STEM Learning Network and STEM designation is located [here](#).

## Community STEM in the NEWS

### **NWO partners with Washington Local Schools on Sustainability and STEAM Project**

The Northwest Ohio Center for Excellence in STEM Education (NWO) at Bowling Green State University's (BGSU) College of Education and Human Development is partnering in the Greater Toledo Community Foundation/Department of Energy grant project, "Sustainability and STEAM", which provides comprehensive programming to support educator and student learning related to renewable energy education.



Recently 4th grade, STEM, and Gifted Educators from Washington Local Schools participated in professional learning workshops hosted by grant partners, First Solar, Imagination Station and the Metroparks.

Fourth Grade Teachers spent a day at First Solar where facilitators from Imagination Station and First Solar engaged them in hands-on, inquiry-based activities focused on Solar Energy. Teachers experienced building a model solar powered house and solar racer cars. The teachers then toured the First Solar plant and observed first-hand solar panel manufacturing. The day also included a tutorial of the on-grounds solar arrays and how the solar panels operate.

Educators will be able to take their gained-knowledge and activities back to their classrooms for implementation with their students. Imagination Station is also providing classrooms with a learning library of books highlighting solar energy.

WLS fourth grade students will have an on-site experience at Imagination Station this winter and in the Spring will visit First Solar.

WLS STEM and Gifted Educators experienced an interactive day at Wildwood Metropark during their all-district PD Day. There, they were introduced to Project WILD, Project Learning Tree and NAAEE's Environmental Education Programs by several Metropark educators. These environmental education initiatives are designed to take students outdoors to learn and connect with nature in urban, suburban, and rural settings while inspiring action for sustainability and introducing young people to careers in natural resources. The training included activity demonstrations (inside and outside) and peer teaching. Educators were also introduced to the Isaac Ludwig Mill, a working water-powered saw and gristmill.

WLS STEM students will be visiting the Ludwig Mill at Providence Metropark in the Spring.

## STEM Opportunities

**Current Ohio STEM Learning Network (OSLN) opportunities**



**NWO STEM Inquiry Series**  
**Scaffolding Extraordinary STEM Culture through Design Thinking, Invention, and Entrepreneurial Spirit**

**January 14, 2025, 5:00 - 8:00 pm**  
Hull Prairie Intermediate School  
25480 Hull Prairie Rd, Perrysburg, OH 43551  
(Light Dinner Provided)  
Facilitator: Jason Hubbard

Registration: <https://forms.gle/P5QmUUY4GAyk6q5V9>

This session will facilitate experiences that will help teachers and school leaders to move toward building a STEM/STEAM culture within their classrooms/their school. Participants will explore a framework of activities focused on scaffolding design thinking and invention that:

- is adaptable across elementary through high school
- moves from light and fun designing for a fairy tale character to thoughtful and planned product design for a real-world community partner
- fosters innovation, entrepreneurial spirit, inquiry, and collaboration with individual accountability for students

This session will help participants move toward competency and development in the following area from the OSLN STEM/STEAM Designation rubric:

*1.1 Cultural Strategies (Minimum rating required for designation: Executing) STEM and STEAM schools exhibit age-appropriate, school-wide cultural strategies reflecting innovation, an entrepreneurial spirit, inquiry, and collaboration with individual accountability.*

*Cultural strategies reflect a community's understanding of success. Community needs drive instructional and delivery strategies in each school. Habits of Mind reflect what a community values in a successful adult and are explicitly taught and continually utilized within the school.*

## Ohio Sustains Space Design Challenge

Each year, the Ohio STEM Learning Network hosts a design challenge where students collaborate to create a workable solution to key issues facing the world. Any school in Ohio can participate in the challenge. The design challenge is the perfect starting point to begin implementing high-quality STEM education best practices in a classroom.

**#OhioSustainsSpace Design Challenge:** How do we improve the sustainability of life in low-Earth orbit, such as living aboard the Starlab space station?

- Connect to industry through the Expert Link and SpaceBytes programs offered in partnership with Starlab
- Register for a guidebook with step by step directions, links to background information and more

<https://osln.org/how-we-help/classroom-opportunities/statewide-design-challenge/>

## Ohio STEM Innovation Summit

**[Build connections, get empowered to lead on June 3, 2025](#)**

The Ohio STEM Learning Network proudly announces the third annual Ohio STEM Innovation Summit will be held on June 3, 2025 at the Greater Columbus Convention Center in Columbus, Ohio. Over the past two years, the Ohio STEM Innovation Summit has become a pivotal gathering for educators, leaders, and partners dedicated to advancing high-quality STEM education in the state. Sold out events in 2023 and 2024 inspired hundreds of attendees to return to their schools and organizations invigorated and prepared to do more.

More details are coming soon. Be sure to [sign up for emails](#) to hear when sessions, exhibitor registration, and tickets are available.

## New in Learning Blade!

We're thrilled to announce that Learning Blade's new **Ohio flyer is now available**, showcasing an updated design for states to help educators seamlessly integrate STEM, computer science, and career awareness into classrooms!

Check it out [here!](#)

**To Sign up for a free account:** [LearningBlade.com/OH](https://LearningBlade.com/OH)

To learn more, schedule **FREE** professional development here:

<https://calendly.com/d/3xc-4s3-99n>

## The Battelle Climate Challenge Opens

The [Battelle Climate Challenge](#) is now open and accepting entries until Feb. 7, 2025. This challenge offers students a chance to win a \$5,000 STEM grant for a public school, library, or non-profit of their choice by learning about the impacts of climate-related hazards within their community and developing a proposed action to help build a more resilient community. Grand prize winners will have the opportunity to present their solution on a national stage at the [Innovations in Climate Resilience Conference](#) in Washington, D.C.

Learn more and sign up for the challenge at: [Battelle Climate Challenge](#)

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## C2S2 - Youth Mental Health First Aid Training

### Youth Mental Health First Aid Training

- Training is open to all adults who work with youth - parents, family members, caregivers, teachers, school staff, group leaders, coaches and other caring citizens.
- Training will cover common signs/symptoms of mental illness in youth, common signs & symptoms of substance use, how to interact with youth in crisis, how to connect the youth with help
- There is no cost to participate.
- Earn 8 Contact Hours Total, including time for online, independent pre & post work



### North Central Ohio ESC, 928 West Market Street Tiffin, Ohio 44883

- Two Dates to choose from - Feb 5, 2025 or March 17, 2025
- 9 A.M. - 3:30 P.M.
- Register [here](#)

### BGSU at Levis Commons, 1655 N. Wilkinson Way, Perrysburg, OH 43551

- March 19
- 9 A.M. - 3:30 P.M.
- Register [here](#)

### Educational Service Center of Lake Erie West, 2275 Collingwood Boulevard Toledo, OH 43620

- April 3
- 9 A.M. - 3:30 P.M.
- Register [here](#)

For more information click [here](#)

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## Ohio Invention League

Ohio Invention League (OIL) is an inclusive, educational, non-profit organization that offers STEAM programming for K-12 students, educators, and out-of-school programs across the state of Ohio. Ohio Invention League welcomes anyone who wishes to inspire curiosity, confidence, and creative problem-solving in Ohio's youth through innovation, invention, and entrepreneurial education!



<https://www.inventionleague.org/>

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## NSTA Professional Learning Opportunity



The National Science Teachers Association (NSTA) is pleased to offer this professional learning opportunity. We are seeking K-12 STEM educators to participate in a Professional Learning Cohort, focused on developing a virtual professional community with professional learning. [Click here for the full PDF.](#)

[Please complete this form indicating your interest in joining our 2024-25 NSTA Professional Learning Community of Practice.](#)

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## TEACHER CONSERVATION INSTITUTE Professional Development Opportunity!



**July 7-10 (K-5 teachers) and July 21-24 (6th-12th teachers), 2025 at the Toledo Zoo and Aquarium**

We are now seeking applicants for our **Project PRAIRIE Teacher Conservation Institute** taking place in July 2025. **This institute is open to any K-12 teacher at a Project PRAIRIE school.** The institute is a PAID experience focused on increasing teacher skills in inquiry-based learning as well as improving conservation knowledge and practices in schools.

Each institute is four days (M-Th) in July and is divided by grade level (July 7-10 for K-5 and July 21-24 for 6-12th).

- Gain project-based and inquiry learning skills
- Receive year-long mentorship from Toledo Zoo and Monarch Joint Venture staff
- Improve your conservation knowledge
- Become a leader in your community
- Acquire additional plants to beautify your school prairie
- Receive science equipment for your class (valued at \$300)
- Learn about monarch butterfly biology
- \$300 stipend to cover your time and expenses

For more information and to apply, please use the following link: <https://forms.gle/mjM3SBnNZXJC8WWAA>

**Contact:** [rowan.schuelke@toledozoo.org](mailto:rowan.schuelke@toledozoo.org)

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## BGSU Robotics and Advanced Manufacturing Research Experience for Teachers



Bowling Green State University Summer 2025 Robotics and Advanced Manufacturing Research Experience for Teachers is open now until February 25, 2025.

This grant provides funding to pay \$6000 to educators currently teaching in high school and community college STEM subjects for participating in the six-week summer 2025

program, \$200 one-time stipend to defray travel cost, lunch and snacks, plus funding for cost of materials and an additional \$500 for implementing their research module into the curriculum during the following academic year. Participants will also receive a Ohio Professional Development verification of Participation certificate.

The focus of the program is to increase interest in STEM fields with topics related to robotics and advanced manufacturing. Summer 2025 program dates are June 9 – July 18, 2025. More information and the link to apply is available on the BGSU [NSF-RET Robotics and Advanced Manufacturing Program](#) website and in the attached flyer.

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## Teach with INFOhio Science Choice Boards



Choice boards are a helpful tool for instruction, supporting and engaging students. Choice boards provide options for students to engage with a topic or concept using a variety of media including eBooks, videos, learning modules, and activities. Choice boards also provide differentiation for students, with a variety of representations of information. They also support building background knowledge and strengthening vocabulary to help students tackle and comprehend more complex text. In addition, choice boards are an easy way to keep students engaged in their learning by giving them choice in how they want to learn the content.

Support PreK-12 students' background knowledge with choice boards on selected science topics including biology, chemistry, earth science, space science, and the scientific method.

<https://www.infohio.org/blog/item/science-choice-boards-to-support-background-knowledge>

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## Educational Service Center of Lake Erie West

### Environmental Education PD Opportunities

Flyer Link: <https://conta.cc/4fF6WwJ>

### Virtual STEM Info Series

All sessions held from 3:45 pm - 4:30 pm via Zoom. Link sent to registrants prior to session

Dates and Registration Links Below:

- January 9, 2025 (asynchronous) [Register Here](#)
- February 13, 2025 (synchronous) [Register Here](#)
- March 6, 2025 (synchronous) [Register Here](#)
- April 3, 2025 (asynchronous) [Register Here](#)
- May 8, 2025 (synchronous) [Register Here](#)



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## 2nd annual NORTech Robotics Challenge

The 2nd annual NORTech Robotics Challenge will be held Thursday, February 20, 2025, from 9:30 am – 2:00 pm at the BGSU Student Union. The [NORTech Registration Link](#) is live.

Events will follow the rules as published in [The NRC 2025 Contest Manual](#). The cost to enter is \$5 per robot. This year there will be 4 additional NORTech EXCLUSIVE events



intended for Elementary and early Middle School students just getting started in robotics.



These are:

- Triathlon (combined score)
- Shuttle Run
- Line Dancing
- Line Following Race

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## 2025 BGSU Summer Camps

Discover summer learning opportunities for youth in third grade through high school with Summer Academic and Youth Programs at Bowling Green State University.



This year, we are offering a combination of virtual and in-person camps. Whether at home or on campus, we promise the camps are engaging, fun and affordable.

Summer Academic Camps provide opportunities for students to connect to Bowling Green State University all while expanding their knowledge, building life skills, and exploring their interests.

Be sure to [visit the Falcon Youth website](#) as new programs are continually added!

### VIRTUAL CAMPS & PROGRAMS

- [Academic Enrichment Camp](#) (Grades 3-8)
- [Forensic Science](#) (Grades 9-12)
- [Future Med: Exploring Health Careers](#) (Grades 9-12)
- [Veterinary Science](#) (Grades 9-12)

### IN-PERSON CAMPS and PROGRAMS

- [Art Workshops](#) (Grades 9-12)
- [Advanced Manufacturing](#) (Grades 9-12)
- [BG: Cyber Guardians](#) (Grades 8-10)
- [Content Creator](#) (Grades 9-12)
- [Discovering Hidden Health Sciences](#) (Grades 9-12)
- [Explore Nursing](#) (Grades 9-12)
- [Farm 2 Fork Camp](#) (Grades 4-6)
- [Ignite STEM](#) (Grades 4-6)
- [Marine Biology Camp](#) (Grades 10-12)
- [News & Sports](#) (Grades 9-12)
- [Pre-Law Camp](#) (Grades 10-12)
- [Summer Music Institute](#) (Grades 7-12)
- [Veterinary Science](#) (Grades 10-12)

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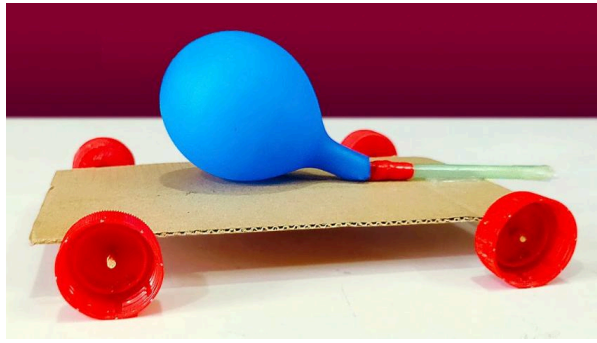


## NWO STEM Activity

### Build a Balloon-Powered Car

Objective:

Students will design, build, and test a simple balloon-powered car using the principles of air pressure, force, and motion. This activity encourages creativity, critical thinking, and problem-solving while introducing concepts in physics and engineering.



**Materials Needed:**

- Balloons (1 per group)
- Plastic straws (1 per group)
- Cardboard or stiff paper (for the car body)
- Bottle caps or small plastic wheels (4)
- Skewers or wooden dowels (for axles)
- Tape, glue, or a hot glue gun
- Scissors
- Ruler
- Markers or decorating materials (optional)

**Procedure:**

**Introduction:**

- Begin by discussing the concept of air pressure and how a balloon works: when air is trapped inside, it pushes against the walls of the balloon, creating pressure. When the opening is released, the air rushes out, pushing the balloon (and the car) in the opposite direction.

**Design Phase:**

- Have students sketch a design for their balloon-powered car. They should think about the best way to attach the balloon, where to place the wheels, and how to ensure their car can move efficiently.

**Building the Car:**

- Cut the cardboard into a rectangular shape (about 10-15 cm long and 5 cm wide) to serve as the body of the car.
- Use the skewers or dowels to make axles and attach the wheels. Ensure the wheels spin freely by adjusting the placement of the axles.
- Use tape or glue to attach the balloon to the back of the car, ensuring that the opening of the balloon is facing backward and can be inflated.
- Attach a straw to the opening of the balloon to direct the air backward when the balloon is inflated.

**Testing the Car:**

- Inflate the balloon by blowing air into the straw or using a pump. Secure the balloon in place on the car, and then release the air to see how the car moves.
- Students can experiment with different sizes and shapes of the car body, as well as the size of the balloon, to see how these changes affect the car's

speed and distance.

**Refining the Design:**

- After testing, students can make adjustments to improve the performance of their cars. They might change the weight distribution, adjust the wheel design, or use a larger or smaller balloon.

**Competition:**

- Once the cars are completed, organize a race where the cars will compete to see which one travels the furthest or fastest.

**Scientific Principles:**

- Air Pressure and Force: The balloon creates a force when air escapes, pushing the car forward.
- Motion and Speed: The size of the balloon, the weight of the car, and the friction between the wheels and the surface will all influence how fast or far the car travels.
- Engineering Design: The activity encourages students to apply principles of design and testing to solve real-world problems.

**Reflection Questions:**

- What design changes made your car go faster or farther?
- How did the size of the balloon affect the car's performance?
- What role does friction play in the motion of your car?

This activity combines fun with science, helping students learn key concepts in physics and engineering while fostering teamwork and creativity.

**Share Your Story!**

Thank you for your support of NWO, our programs, our activities, and our partners. Please send us updates, press releases, and news of STEM happenings at your school, district, or organization. Please submit to [nwo@bgsu.edu](mailto:nwo@bgsu.edu). We are always looking for great STEM education stories to feature in upcoming newsletters.

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