Dec 11 2024

News, Resources, & Notes

this issue

Upcoming Events:

1. NORTech Robotics Challenge, February 20, 2025, Bowling Green
2. ITEEA 2025 Conference, April 2-5, 2025, St. Louis, MO
3. National Robotics Challenge April 3-5, 2025, Marion

OTEEA webinars online archive

OTEEA News, Resources, and Notes online archive

STEM is Elementary Newsletter Subscription And Archived Issues

STEM competitions and more resources spreadsheet

Link to OTEEA membership form

NORTech Robotics Challenge

The NORTech Registration Link is live. 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.

Events will follow the rules as published in The NRC 2025 Contest Manual. The cost to enter is $5 per robot.

This year we are introducing 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

At the end of this newsletter is a flyer and the Robotic Triathlon rules.

If you would like to help judge, please complete the registration form with your information including the names of people from your business or organization, and choose the event(s) you are interested in judging from the pull-down menu. Thank you for all the work you do with students.

Contact if you have any questions:
Gabe Oberlin, MEdAdmin
Horticulture & Technology Instructor
Patrick Henry High School
work: 419-274-5026

Highlights of the 1909 Conference

What is the 1909 Conference? It is a recent merger of the Mississippi Valley Technology Teacher Education Conference (MVTTEC) and the Southeastern Technology Education Conference (STEC). The conference has been teacher educators, teachers, district TEE personnel, and TEE publishers meeting since 1909 to discuss what is important in our field and research to help move us forward.

This year the conference met November 14 & 15 in Memphis, TN.

Highlights of some the sessions related to innovation in TEE classes today are below. Title are link to the paper where available.

Empowering students through gold-standard problem-based learning in technology and engineering education

This presentation explored the transformative potential of Problem-Based Learning (PBL) to equip both pre-service and in-service technology and engineering educators with the pedagogical skills necessary to foster innovative and critical thinkers. We explore PBL Works (formerly the Buck Institute), framework for Gold-Standard PBL, emphasizing its seven essential elements.

Presenters: Molly S. Miller, Penn Manor High School & Scott A. Warner, Millersville University

Weaving indigenous and diverse perspectives into integrated STEM education

Engaging students from diverse backgrounds requires integrating their cultures and languages into STEM education. This presentation explored how to achieve this by focusing on the TRAILS (Teachers and Researchers Advancing Integrated Lessons in STEM) project, specifically its adaptation for the Hawaii cohort in its third year. Hawaii's culturally rich environment presented a unique opportunity to modify the TRAILS project and the presentation will showcase how the program was adapted for this context.

Presenters: Jung Han, Purdue University; J. Geoffrey Knowles, Bryan College; & Todd Kelley, Purdue University

Making and doing essentials for STEM education

Since the early 21st century, the Technology Education/Technology Engineering field has evolved to include pre-engineering and STEM concepts, while traditional educator preparation programs have declined, leading to an influx of non-traditional teachers. This shift has created a need for essential "making and doing" skills—creative thinking, problem-solving, visualization, prototyping, and using tools and machines—to ensure continuity with the foundational principles of Technology Education and enhance STEM learning experiences. They have developed some great Quick Start Guides on visualization, prototyping and fabrication.

Presenters: Steven L. Miller, North Carolina State University & Glenn R. Moore, III, New Hanover High School

From trash to a career: Using post-consumed plastic to spark critical thinking in today's sustainability-minded students

Recycling High-Density Polyethylene (HDPE) offers both an environmental solution to plastic waste and a powerful educational tool to inspire future sustainability leaders. By integrating HDPE recycling into curricula, students gain hands-on experience with real-world sustainability challenges, preparing them for impactful careers in recycling, engineering, and environmental science. This was a particularly exciting presentation with many examples passed around.

Presenter: Randall W. Jordan Jr, Fort Hays State University

The potential of children using programmable robot construction kits: A comparative study of expected and actual abilities and skills of primary school children

This study involving children and their parents examined the gap between children's actual abilities and their parents' assessments in building and programming LEGO® Education SPIKE™ robots. The results showed that parents consistently underestimated their children's skills, with the underestimation becoming more pronounced from second to fourth grade.

Presenters: Martin Fislake, Leah Marlene Christ, & Lina Klaes, University of Koblenz, Germany

A proposed study on digital vs. physical engineering notebooks and their alignment with the Standards for Technological and Engineering Literacy

This study explores the integration of digital engineering notebooks in technology and engineering curricula, aiming to provide students with practical documentation skills for future academic and professional settings. By comparing digital and physical notebooks, the research investigates student experiences and challenges, offering recommendations for best practices in aligning digital tools with educational standards.

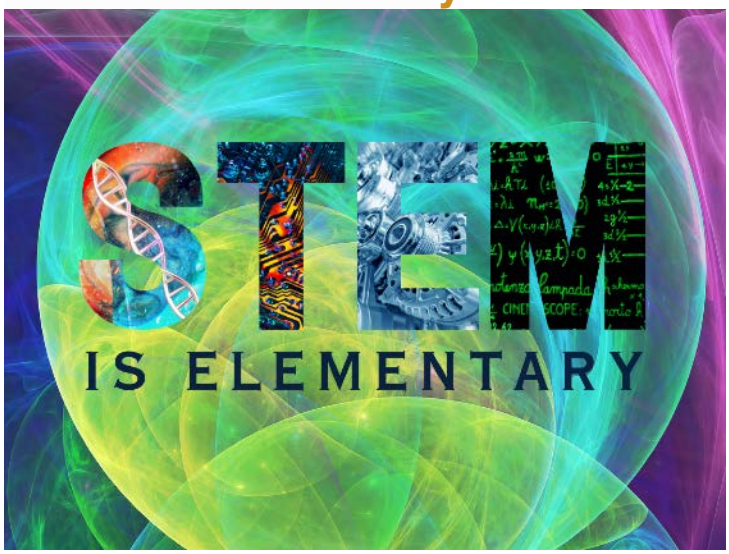
Presenters: Marissa M.S. Franzen and Erik Schettig, North Carolina State University

Designing Technology for People

Incorporating ethnographic methods into design technology classrooms equips students to practice human-centered design by fostering empathy and understanding of cultural factors shaping user experiences. Purdue University's course, Designing Technology for People, co-taught by anthropology and design educators, uses ethnographic research to guide students in developing design mock-ups, with this presentation highlighting the specific pedagogical strategies used to teach these methods.

Presenters: Sarah Renkert, Sherylyn Briller, Abrar Hammoud, Jung Han, & Todd Kelley, Purdue University

STEM Is Elementary



The December issue of STEM is Elementary is available here.

25th Annual Great Big Home and Garden Show Student Design Contest

Find the contest packet with the rules, regulations, entry form, and grading rubric here. Please note there have been some changes to the contest this year. You should also find the civil sheets for the contest here. First deadline is soon. Questions? Contact Erik Ward.

5 Approaches That Engage Middle School Students in STEM Learning

eSchool News Laura Ascione

As students progress through middle school, STEM learning should focus on building curiosity, confidence, and foundational skills

Key points:

- Middle school students can love STEM learning–with a little creativity
- Rethinking STEM to shape the future workforce
- For more news on STEM learning, visit eSN's STEM & STEAM hub

Creating engaging STEM learning experiences in middle school is essential to spark curiosity, build foundational skills, and foster a love for STEM topics–and potentially encourage students to pursue STEM careers.

Read more

Technology and Engineering Education News and Resources

Activities, Contests, Student Opportunities, and New Technologies

Interesting Design Challenge Idea

Read this report, Innovative Approaches to Enhancing Safety and Efficiency in Work Zones and challenge students to design solutions to the problem.

ITEEA's Virtual STEM Conference Sessions Available "on Demand"

ITEEA 2024
INAUGURAL VIRTUAL FALL STEM CONFERENCE

Weren't able to attend the in-person 2024 Virtual STEM Conference? It's not too late to purchase access to all conference sessions and resources, available at your convenience. Earn up to 36 hours of Professional Development, discover new products through Action Labs, and view sessions on a variety of topics including AI, Safety, Environmental STEM, and International Perspectives as well as content specifically for New to STEM, Elementary, and Secondary educators.

Purchase access

Register Now for ITEEA's 2025 Conference in St. Louis

GATEWAY TO THE FUTURE
ITEEA 2025
St. Louis, MO
April 2-5
CONNECT, INNOVATE AND THRIVE

In April 2025, we converge to explore the transformative power of technology and engineering education. Together, we'll delve into how educators can amplify the benefits of innovation and forge connections that enable you and your students to thrive. View the preliminary Agenda At-a-Glance.

Registration

Enroll in ITEEA's New Self-Paced Course To Train in Onshape

This new asynchronous course is completely self-paced, consisting of three units with five learning cycles, and a preliminary and primary challenge. You will work within Onshape and ITEEA's Buzz learning management system to complete all of the learning cycle and challenge activities, just as your students would, and then submit your portfolio for review to receive your certificate of completion. Train at your convenience!

Read more

Latest Issue of ITEEA's Journal of Technology Education Is Now Available Online — Open to all

Journal of Technology Education

Volume 36 — Issue 1 is now available and covers topics such as Co-Designing and Implementing a Fourth Grade Robotics and Coding Event, Exploring Artifact Definitions in Project Management Education, An Open-Source Adaptive Comparative Judgment App for Technology Education Research and Practice, and Maker Education Meets Technology Education: Reflections on Good Practices.

Access journal

Promoting Active Engagement in Middle School

Edutopia

A teacher shares her strategies for creating a culture and routines that foster students' sense of involvement in the classroom.

Read more

Wilbur and Orville Wright Flew Together Only Once

History Facts

Wright brothers made aviation history on December 17, 1903, as Orville Wright piloted the groundbreaking Wright Flyer aircraft for the world's first powered flight while Wilbur Wright ran alongside. This event marked one of many instances where one brother took to the skies while the other remained on land, as the pair flew in an aircraft together only once. It was a conscious decision stemming from a promise that Orville and Wilbur made to their father, Milton Wright, vowing to never fly together because of the risk of a plane crash. The safety measure also ensured that if one suffered an accident, the other could continue their pioneering aeronautical work. Such an incident nearly occurred on September 17, 1908, during the world's first fatal plane crash. With Orville at the helm, the flight tragically claimed the life of a passenger on board, U.S. Army Lieutenant Thomas E. Selfridge, though Orville survived the ordeal.

On May 25, 1910, the Wright brothers flew together for the first and only time in their lives. That day, Milton Wright permitted his sons to conduct a six-minute flight together near Dayton, Ohio. With Orville piloting the plane and Wilbur as his passenger, the duo ascended into the sky and landed without issue. Orville then took his 81-year-old father aboard the plane for the first and only flight of the patriarch's life; as the plane gained elevation, Milton excitedly shouted, "Higher, Orville, higher!"

How Are Macy's Thanksgiving Day Parade Balloons Made?

The Kid Should See This

Every Thanksgiving since 1924 (with a brief pause during WWII), towering balloon characters float above Manhattan's streets, following a grand route from the West Side to Herald Square in a holiday tradition. This Scholastic video takes viewers inside the Macy's Parade Studio, revealing how Macy's Thanksgiving Day Parade balloons are…

Watch the video

Best STEM Subscription Boxes for Kids: Hands-on Reviews

STEM Education Guide

STEM subscription boxes are a fun and engaging way for kids to learn about science, technology, engineering, and mathematics. You can think of these subscription-based kits as mini classrooms sent straight to the home, giving children a hands-on approach to learning. Each month, they receive a new box filled with STEM activities and projects designed to pique their curiosity and develop critical thinking skills.

Read more

Exploring Codable Circuits With Makey Makey

ESC of Central Ohio

February 6
In this course, participants will use block-based coding and everyday materials to create custom controllers, instruments, and other input devices with Makey Makey. After the training, participants will plan and implement a lesson in their own contexts. The final 1-hour virtual session (4/24) will give participants the opportunity to share successful project implementation.

Participants will receive 2 Makey Makey Classics and 2 Craft and Code Booster Kits for their schools!

Read more and register

OETC25 Session Schedule Is Here!

OHIO EDUCATIONAL TECHNOLOGY CONFERENCE

The presentation schedule for OETC25 is available now! Check out the sessions, presenters, and many exciting topics that explore the conference theme of “Innovation. Access. Collaboration.” Sessions are centered around the conference tracks that include instruction, information technology, leadership, and library and media specialists

Early bird registration is available through Nov. 28. OETC will be at the Greater Columbus Convention Center on Feb. 11-13, 2025. You can book your hotel stay through the Experience Columbus Passkey.

Presenters will have received a separate email from the conference sharing information about their proposals, room and time assignments, and how to register.

Keep an eye on @OhioEdTech on X (Twitter), Facebook and the conference website https://oetc.ohio.gov/ as we release more information about keynotes, sandbox presentations, student demonstrations, exhibitions, and vendors. There is lots of exciting news on the way!

Please reach out to info@oetc.ohio.gov with any questions.

OETC25 We Need Your Help!

Are you an educator passionate about interactive, hands-on learning? Share your expertise at OETC 2025! We are seeking dynamic teachers to lead informal playground sessions in the following areas:

- **Drones in Education:** Showcase how drones can enhance learning and inspire students in innovative ways.
- **Elementary EdTech:** Introduce tools and resources to engage young learners with technology in creative, age-appropriate ways.
- **Literacy Tools & Strategies:** Share cutting-edge tech, resources, and techniques to improve reading and literacy in the classroom.
- **Civic Engagement:** Explore how technology and tech-related resources can empower students to engage with and impact their communities.

What is a Playground Session?

A Playground Session is not your average conference session! These sessions emphasize hands-on learning, experimentation, and conversation. Designed for teachers to come and go, participants can try out tools, engage in discussions, and get inspired with new ideas to bring back to their classrooms.

Why Host a Playground Session?

- **Share Your Expertise:** Showcase your classroom successes and innovative strategies.
- **Network & Learn:** Connect with educators from across Ohio and exchange ideas.
- **Two Free Conference Registrations:** Hosting comes with complimentary access for two to OETC 2024!

Learn more and submit your proposal before December 23!

Model Railroading Adhesives and Glues

No matter what scale you're modeling in or what era you prefer, there is no doubt that you'll encounter the need to use an adhesive sooner than later. Whether it's laying cork roadbed, building a structure, or applying detail parts, everyone needs a variety of adhesives for a variety of tasks. This list should help you decide what model railroading adhesives and glues you need for your workbench.

Read more

Empowered To Innovate: Women in STEM Entrepreneurship

The Government-University-Industry-Philanthropy Research Roundtable will convene a webinar discussing actionable strategies to support women in STEM entrepreneurship. Panelists will share insights on building sustainable networks, mentoring future leaders, and fostering innovation across sectors, including academia, industry, venture capital, and philanthropy.

The discussion will highlight best practices for sustaining women in entrepreneurial spaces and explore models that leverage peer groups and coaching to empower women for long-term success. Emphasis will be placed on dismantling barriers, nurturing diverse talent, and creating inclusive environments that promote innovation.

Read more and register

Winter Edition of the EECO News!

Here it is folks, an early holiday gift! The amazing EECO Newsletter- Winter Edition. This newsletter is packed full of inspiring articles, information and upcoming events that you will not want to miss. Download your copy here.

Thank you to all of the contributors and volunteers who worked on this incredible publication. Extra special thanks to Lynn White who has been working tirelessly behind the scenes for years on this fabulous quarterly newsletter!

To see all of the EECO publications checkout our library on the website by clicking the button below.

EECO Publications

Some Tips From SPARCC Lines

SPARCC - http://ti.apps.sparcc.org

Learn About - Resource Link

- According to Google, Learn About is a "conversational learning companion designed to help you dive deeper into any topic you're curious about with Google AI".
- In other words, it is like Gemini or ChatGPT, but with an extra layer of learning resources.
- The resources can include images, videos, interactive timelines, vocabulary cards, practical applications, interactive lists to dive deeper, related content to explore, follow-up questions and topics, and more.
- My guess is these may be features that eventually get integrated into Gemini, but for now this is a great way to explore them and learn new content in an engaging way.
- At the moment you do need to be signed into your Google account, and 18 years of age or older, to use Learn About.

Old School Quiz - Resource Link

- On the lighter side of things, how well can you identify old or outdated items that used to be commonplace in schools?
- This quiz is a little silly, but it is also fun to see how many of these older items from school you can identify.
- Seeing as how this is my 33rd year in education, I did pretty well and got 21 out of 22 correct, which gave me the rating of "Old as Dirt".
- How did you do? What would you add to this list?

Bluesky Starter Tips for Educators - Resource Link

- Recently Bluesky has exploded in popularity, especially with educators.
- If you are curious to learn more, or if you have joined but could use some help getting started, I put together a new blog post on "Bluesky Starter Tips for Educators".
- The post covers signing up, creating your profile, connecting with the EduSky community, following people, using Starter Packs, joining EduChats, adding custom feeds, refollowing Twitter friends, and more!
- If you do join, you can connect with Eric here: https://bsky.app/profile/ericcurts.bsky.social
- He would love to connect with you there and keep learning together!

Is Drone Herding Really Viable in Cattle Farming?

Interesting Engineering

Image from AgriFutures growAG

An Australian firm named SkyKelpie has demonstrated effective drone herding of cattle. Using a remote docking station, its herding drones waste no time in getting to work. Could remote drone herding take the uncertainty and the hard riding out of cattle farming?

Read more and watch video

Interesting Engineering Newsletters

INTERESTING ENGINEERING

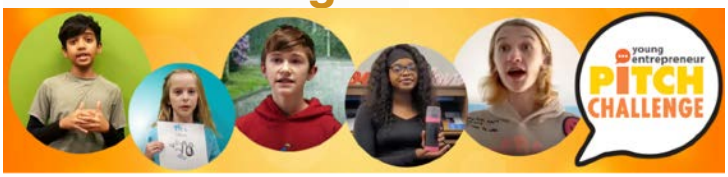
You can sign up for any of Interesting Engineering's ten newsletters here. They cover a variety of engineering topics.

The Hidden World of Underground Delivery Systems

Interesting Engineering

Exciting innovations in automated delivery systems are overcoming challenges by going underground. Underground tunnels could be the solution for deliveries to fix pollution, congestion and even ageing populations.
Read more and watch video

Are You Signed Up for This Year's Young Entrepreneur Pitch Challenge?!



There is only *ONE WEEK LEFT* to register your class or program for this year's Ohio Young Entrepreneur Pitch Challenge!

Pitch Challenge teaches kids how to identify a problem in their community, school or the world and ideate solutions that could become a business.

We have resources and experts that can help you incorporate the pitch challenge into your class or program seamlessly!

Have the YEI team present a workshop to your classroom or staff. Book a workshop on YIPPEE Exchange.

Would you like help thinking through the best way to implement Pitch into your classroom or program? Sign up for a free consultation with us.

Register Your Class or Program by Dec. 15!

When your class or program submits 10 or more video submissions, you win a free pizza, ice cream or donut party for your class.

Plus, students can win up to $250 with a winning pitch!

Please contact mdwilson@us.edu with any questions.

18 Artists, 3 Days, and a Beach Full of Giant Sand Sculptures

Interesting Engineering

At St. Helen's annual Sand Island Sand Castle Competition, eighteen artists spent three days transforming beach sand into intricate sculptures. The process begins with careful preparation: teams of two mix sand with water, then spend hours methodically pounding it becomes densely packed and stable enough to carve.

Like sketching in other media, the work starts with blocking out the basic forms. "We're blocking out our design," Leonard Gonzalez explains, "trying to find everything and how it's going to lay out in our forms."

Read more and watch video

First Look Inside Rebuilt Notre-Dame

BBC

Read more and watch video

More from Smithsonian Magazine

3 Tips to Authentically Engage Students in Real-World STEM Learning

eSchool News Petra van't Slot, High School Science Teacher

Even reluctant students become interested in science when they know their work is applicable to the world around them

Key points:

- Students are motivated to dig deep into science with real-world implications
- Rethinking STEM to shape the future workforce
- Getting pre-service teachers comfortable using and teaching with STEAM tools
- For more news on science learning, visit eSN's STEM & STEAM hub

Earlier this year, I was teaching science to a group of rising 9th grade students involved in a summer learning program. Despite not having access to a dedicated lab space, it was important my students had the opportunity to engage in hands-on, tech-enabled, and real-world learning.

All the boxes needed to be checked–the investigations needed to be:

- Hands-on
- Related to students' lived experience
- Quantitative, ideally with a dependent variable that could be measured
- Entry level as the students in the program had hugely varying levels of experience and exposure
- Low-hazard for students as well as the room, which was carpeted and did not provide access to sinks or running water
- Doable without chemical glassware

The hands-on component was especially important as this type of learning connects students with the process of science–in particular, it allows them to practice making observations and to identify possible patterns, or the lack thereof.

Read more

What's It Like Working 200 Feet Up in a Tower Crane?

The Kid Should See This

In the pre-dawn darkness of a Norwegian winter, when temperatures can plunge to -15°C, Mina Farmen Bertheussen begins her hour-long commute to work. And once she's there, she still has to climb 60 meters—nearly 200 feet—up to

reach her office: the climate-controlled cabin of a tower crane overlooking the city.

This BBC Earth Explore video shares a Day in the Life of a Female Crane Operator.

Read more and watch video

World's First Urban Wind Turbine Designed by AI Offers 7x More Efficiency

Birmingham Blade prototype unveiled at the University of Birmingham, UK. University of Birmingham Enterprise

The evolutionary simulations conducted by EvoPhase have confirmed the Birmingham Blade is up to seven times more efficient than existing designs.

Read more

Links to several videos

6 Inventions That Came Out of the Victorian Era

History Facts

Photo credit: Tony Smith/ Alamy Stock Photo

Queen Victoria ruled Britain from 1837 until her death in 1901. Her reign of 63 years and 216 days was longer than that of any of her predecessors, and was exceeded only by Elizabeth II's time on the throne. This period, known as the Victorian era, saw the British Empire expand to become the first global industrial power.

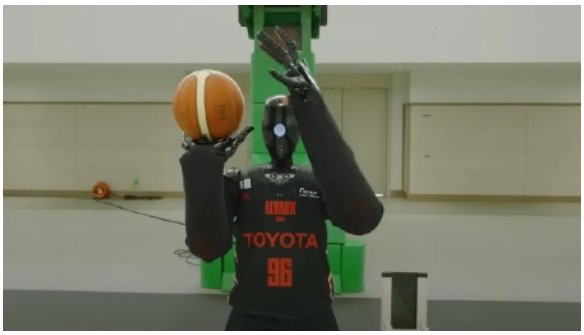
Victorian-era Brits were avid inventors, and many of the creations from this time had a major impact not only in Britain but across the globe. That's not to say that all Victorian innovations were a hit. The hat cigar holder, ventilating top hat, anti-garroting cravat, reversible trousers, and "corset with expansible busts" all rank among the less successful ideas. These failures, however, were far outweighed by the era's many influential developments, some of which laid the foundation for our modern age, and are still used every day. Here are some of the greatest innovations of the Victorian era, from the telephone to the electric light bulb.

Read more

Watch: Toyota's Humanoid Robot Breaks World Record for Longest Basketball Shot

Interesting Engineering

CUE6 uses AI to learn from mistakes, adjusting aim, posture, arm position, and shot strength in real-time like an athlete.

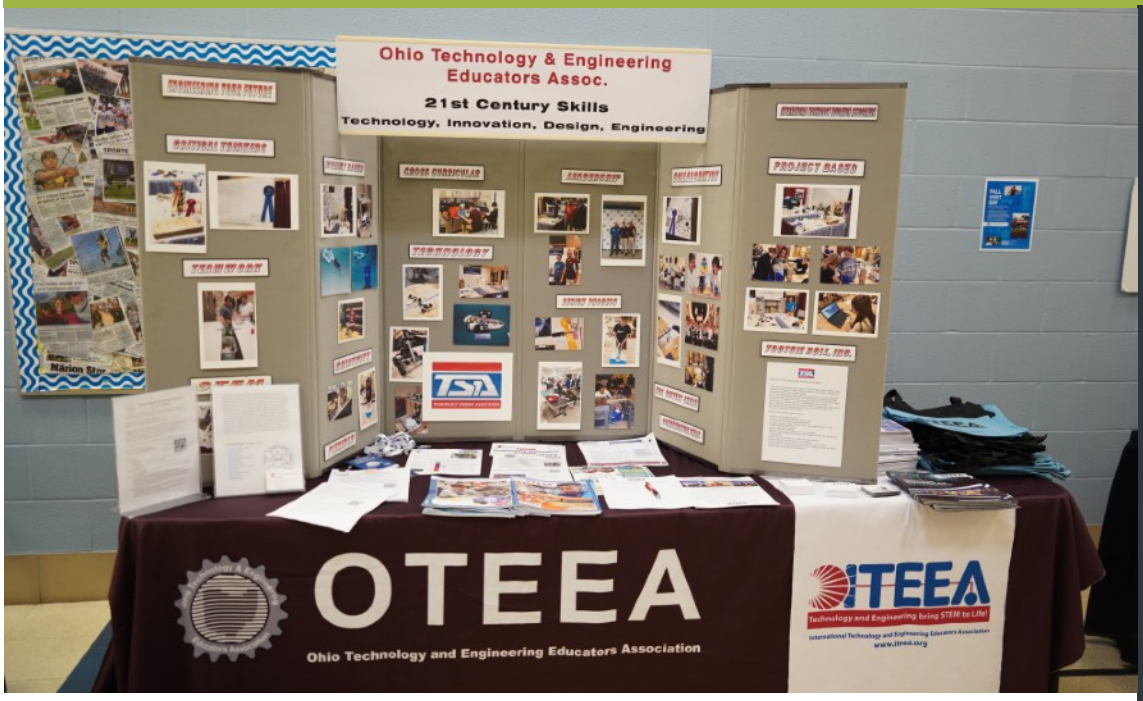


GWR/YouTube

Toyota's humanoid robot, CUE6, amazed onlookers by achieving the farthest basketball shot by a humanoid robot.

The AI-powered robot completed a seemingly difficult shot from 24.55 meters (80 feet 6 inches), earning its second Guinness World Records (GWR) title.

Read more and watch video



1. The Outreach group is looking for more members!

2. Working on planning future outreach activities

3. Have a story to tell about your program or students? Let us know!

4. The webinar has been discontinued. Archived webinars can be viewed at online.

5. What OTEEA programming would you like to see?

Contact Paul Post

"The technology you use impresses no one. The experience you create with it is everything." Sean Gerety

This Week's Technology Tip

Build a Paddle Board

Woodworkers Guild of America

What a great project! If you've ever wanted to own a standup paddle board, here's your chance to see what it takes to build one. It starts with a kit from Jarvis Boards.

The Jarvis kit gives you the skeleton of the SUP; the ribs and rails that provide the boards structure. Jarvis sells a bunch of different kits so you can make a board that matches your needs. Even better, if you want a design they don't have they'll custom create a kit for you.

Read more and watch

Northwest Ohio Regional Technology Robotics Challenge

NORTech ROBOTICS CHALLENGE

Events

- Box Bot
- Combat Robot
- Mini-Sumo Robot
- Manufacturing Workcell
- Rescue Robot
- Robo Hockey
- Robot Maze Contest
- Sumo Robot

Date:
February 20, 2025

Venue:
Bowling Green State University®

New for 2025

- Shuttle Run
- Line Following Race
- Line Dancing
- Triathlon

Gabe Oberlin
goberlin@phpatriots.org
419-274-5026

Robotics Triathlon Rules

Intended for elementary and middle school students using commonly available educational robots like LEGO Mindstorms, VEX IQ, or similar kits. This activity combines competition with skill-building in robotics and engineering.

Objective: Each robot will compete in three events—Shuttle Run, Line Dancing, and Line Following—scoring points in each challenge. The robot with the highest combined score across all three events will be the Robotics Triathlon champion.

1. Robot Specifications
    a. Type: Robots must be assembled from educational robotics kits (e.g., LEGO Mindstorms, VEX IQ, Makeblock), with programming completed in advance.
    b. Size and Weight Limits: Robots should not exceed 8 inches in width, 8 inches in length, and 12 inches in height, with a weight limit of 2 pounds.
    c. Sensor and Component Restrictions: Robots can use line-tracking sensors, distance sensors, and light sensors but may not use GPS or external guidance.
2. Event Breakdown
    a. Event 1: Shuttle Run (Agility Test)
        i. Weighting: This event is weighted at ⅓ of the final score.
    b. Event 2: Line Dancing (Rhythm and Synchronization)
        i. Weighting: This event is weighted at ⅓ of the final score.
    c. Event 3: Line Following (Precision and Navigation)
        i. Weighting: This event is weighted at ⅓ of the final score.
3. Scoring and Ranking
    a. Overall Scoring: Each event is scored individually, and points are converted into a ranking for that event. For example, the first-place robot in an event receives one point, second-place receives 2, and so on.
    b. Aggregate Scoring: Total scores from all three events are combined to determine the overall ranking. A score of three would be awarded to a robot who placed 1st in all three events.
    c. The robot that completes all three events with the lowest aggregate score will be declared the winner.
4. Safety and Conduct
    a. Robot Safety: Robots must be constructed safely, with no loose or hazardous components.
    b. Fair Play: Robots may not interfere with other robots or obstruct the track. Unsportsmanlike behavior may result in penalties or disqualification.
    c. Testing Period: Each team will have a set time before the triathlon starts to calibrate their robots for each event.
5. Awards and Recognition
    a. Triathlon Champion: Awarded to the team with the highest combined score across all events.
    b. Event-Specific Awards: Additional recognition for teams achieving the highest score in each event.
    c. Creativity Award: Given for the most innovative or visually creative robot design.

This Robotics Triathlon challenges students to design, program, and adapt their robots for varied tasks, emphasizing versatility and broad robotics skills. The competition format not only hones their technical abilities but also encourages creativity, teamwork, and sportsmanship.

NORTech Robotics Challenge BGSU

Shuttle Run Robotics Challenge

Intended for elementary and middle school students using commonly available educational robots like LEGO Mindstorms, VEX IQ, or similar kits. This activity combines competition with skill-building in robotics and engineering.

Objective: The goal is for each team to program and control a robot to complete a shuttle run, navigating a straight path to the far end of the field, returning to the start line, and repeating the process for two complete laps as quickly as possible. The robot with the fastest completion time wins.

1. Robot Specifications:
    a. Type: Robots must be created from widely accessible educational kits like LEGO Mindstorms, VEX IQ, Makeblock, Sphero, etc.
    b. Size Limit: Robots should not exceed 8 inches in width, 8 inches in length, and 12 inches in height.
    c. Weight: Total weight should not exceed 2 pounds.
    d. The robot must have a front and back marked with an arrow towards the forward face.
    e. Autonomous or Remote-Controlled: Teams may choose either autonomous operation or remote-controlled navigation. Remote-controlled robots will receive a -15 second time penalty.
2. Course Specifications
    a. Length of Course: The shuttle run path will be a straight 8-foot track with a marked starting line 12 inches from the starting wall and a turnaround line 12 inches from the other end.
    b. The walls at both ends of the track will be 3.5 inches tall.
    c. The lane width will be 12 inches, and marked with lines.
    d. There will be a black center line running the length of the course.
    e. Surface: The track surface will be a smooth, non-slip mat or similar surface to ensure stable movement.
3. Rules for the Shuttle Run:
    a. Task Completion: Robots must complete 2 laps down & back while staying in their lane.
    b. Turnaround: The robots must turn around when changing direction. i.e. they may not go forward for one length and then backward for the next.
    c. Penalties: There will be a -5 second time penalty if the robot crosses outside designated path lines.
    d. If a robot comes into contact with another robot, the robot outside of its designated lane will be disqualified for that run.
4. Scoring and Judging Criteria
    a. The robot with the fastest single time to traverse the course will be the Speed Champion.
    b. Autonomous advantage: In the event that a robot operating autonomously ties the time with a remotely controlled robot the autonomous robot will be declared the champion.
    c. Reliability: the robot with the fastest average time to traverse the course will be declared the Reliability Champion.
    d. Creativity and Innovation: Judges may recognize unique designs, innovative mechanisms, or sensors used to improve shuttle efficiency with the Creativity Champion award.
5. Safety and Fair Play
    a. All teams must adhere to safety protocols, including secure attachment of parts, stable handling, and no intentional obstruction of other robots. Fair play is essential; teams found interfering with others may be disqualified.

Robot Line Dance Challenge Rules

Intended for elementary and middle school students using commonly available educational robots like LEGO Mindstorms, VEX IQ, or similar kits. This activity combines competition with skill-building in robotics and engineering.

Objective: The goal is for students to program a robot to perform dance moves inspired by the Cotton-Eyed Joe line dance. Each robot must navigate a dance floor, synchronizing to the beat and repeating a series of programmed moves. Points are awarded based on timing, creativity, and accuracy.

1. Robot Specifications
    a. Type of Robots: Teams may use robots from common educational kits (LEGO Mindstorms, VEX IQ, etc.), with all programming done in advance.
    b. Size Limit: Each robot may be up to 8 inches in width, 8 inches in length, and 12 inches in height.
    c. Weight: Total weight should not exceed 2 pounds.
    d. Number of Robots: Individual robots will be judged on timing, accuracy, choreography, and style. Each school may compete with multiple robots performing a coordinated group of robots for more complex choreography.
2. Dance Floor Setup
    a. Floor Size: The designated “dance floor” will be a 6x6 foot square marked with a grid for reference, helping robots align their movements.
    b. Dance Zones: The floor may include up to four designated “dance zones” (marked areas where specific moves need to be executed).
    c. Lighting and Music: The Cotton-Eyed Joe song will play, with a set beat for timing. Optional lighting cues may be used to help indicate when certain moves should be executed.
3. Dance Move Requirements
    a. Teams must program their robots to perform a series of moves inspired by line dancing. Required moves may include:
        i. Forward Step and Back Step: Moving forward and backward in sync with the beat.
        ii. Side Step (or Shimmy): Moving to the left or right across the grid.
        iii. 360° Spin: Completing a full spin at specific points in the routine.
        iv. “Do-Si-Do”: If using multiple robots, they must navigate around each other in a circle or square pattern.
        v. Freestyle: An opportunity for teams to incorporate a creative move inspired by their unique robot design.
4. Rules and Scoring Criteria: Robots will receive a score from 1-10 based on the following criteria. The team score will also include a score for uniformity of moves.
    a. Timing and Rhythm (25%): Robots must keep in sync with the beat, demonstrating timing accuracy and consistency throughout the dance.
    b. Accuracy of Moves (25%): Each required move must be executed accurately within the designated dance zones. Points are deducted if the robot misses a move or strays from the zone.
    c. Choreography and Creativity (25%): Teams are encouraged to create innovative moves or combine moves for a unique routine. Creativity in movement, design, and synchronization will earn additional points.
    d. Performance and Style (25%): Robots are encouraged to “dress up” (e.g., hats, cowboy-themed decorations) and show flair through movement to embody the spirit of Cotton-Eyed Joe.
5. Safety and Conduct
    a. Robot Safety: All robots must be stable and secure; no loose parts or hazardous attachments are allowed.
    b. Fair Play: Teams may not interfere with other robots on the dance floor. Teams are encouraged to collaborate respectfully and celebrate each other's performances.
6. Competition Format
    a. Each team will have a 2-minute routine to perform on the dance floor. Judges will score based on the criteria above, with prizes for the best timing, creativity, and overall performance.

This competition makes programming fun and also challenges students to think creatively about how robots can mimic human actions and rhythms in a lighthearted, music-filled challenge.

Line Following Race Rules

Intended for elementary and middle school students using commonly available educational robots like LEGO Mindstorms, VEX IQ, or similar kits. This activity combines competition with skill-building in robotics and engineering.

Objective: The goal is for each robot to follow a black line on a white surface, navigating curves, sharp turns, and straightaways as quickly as possible. The robot that completes the course in the shortest time wins.

1. Robot Specifications
    a. Type of Robots: Robots must be built from educational robotics kits (e.g., LEGO Mindstorms, VEX IQ, Arduino-based kits).
    b. Size Limit: Robots cannot exceed 8 inches in width, 8 inches in length, and 12 inches in height.
    c. Weight: Total weight should not exceed 2 pounds.
    d. Sensors: Each robot can be equipped with light, color, or line-tracking sensors to detect the line, but no external guidance or assistance is allowed.
2. Course Specifications
    a. Track Width: The black line will be 1 inch wide, set against a white surface to provide contrast.
    b. Course Length: The track will be approximately 10–15 feet long, containing a mix of straight paths, curves, and at least one 90° turn.
    c. Boundaries: Robots must remain within a 3-inch buffer zone around the track. Leaving this buffer zone counts as a "track exit."
3. Race Rules
    a. Starting and Ending: Robots will start behind a designated line and end when the robot crosses the finish line. Time begins once the robot starts moving and stops when the finish line is crossed.
    b. Track Exits: If a robot exits the track, the timer pauses, and the robot must be placed back on the track at the last exit point. Each track exit incurs a 5-second penalty.
    c. Sensor Use: Robots must navigate using only their sensors—no remote control is allowed during the race.
    d. Autonomous Operation: Robots must operate autonomously throughout the course. Any manual intervention disqualifies the robot from that race attempt.
4. Scoring and Timing
    a. Race Timing: Each team gets two timed attempts, and the faster time is recorded. The shortest completion time, after penalties, determines the winner.
    b. Penalties: A 5-second penalty applies for each track exit or if a robot touches a boundary marker.
    c. Tiebreaker: In case of a tie, the robot with fewer penalties is declared the winner. If there is still a tie, a third run will be held as a tiebreaker.
5. Safety and Conduct
    a. Robot Safety: All robots must be securely constructed to avoid breakdowns during the race. Teams must ensure their robots are safe for both participants and the course.
    b. Fair Play: Teams should not interfere with other robots or obstruct the track. Unsportsmanlike behavior may lead to disqualification.
6. Judging Criteria
    a. Speed and Accuracy (50%): The primary score is based on completion time after penalties.
    b. Reliability (30%): Consistent tracking, minimal exits, and smooth handling of curves are key for a high score.
    c. Innovation (20%): Points are awarded for innovative design elements that enhance line-following capability, such as unique sensor placement or advanced algorithms.
7. Competition Format
    a. Trial Runs: Teams will have two trial runs to practice on the track before their official attempts.
    b. Timed Runs: Each team completes two timed runs, with the fastest counted toward final scoring.

This competition provides a balance of speed, precision, and problem-solving, making it ideal for students developing practical robotics skills.