

WE ENERGIES STEM CENTER AT MSOE



ANNUAL REPORT
FISCAL YEAR 2022-23



(Left) Each spring, the MSOE STEM team partners with Milwaukee Public Schools for the annual Robotics Scrimmage. Read about the impact this annual competition has on K-12 students in the community on page 7.

As the We Energies STEM Center at MSOE approaches its third year of operations, it's amazing to see the community that has been built through partnerships with organizations and individuals throughout the Milwaukee community. As an engineer, data is my go-to source for sharing impact. While you'll see the quantitative impact of the STEM Center in this new annual report, I wanted to take this opportunity to also share some of the impactful moments that can't be defined by numbers.

One of my biggest hopes when we opened the STEM Center was for students from all over Milwaukee to have the opportunity to connect with other peers inside their schools, community centers or local neighborhoods. Our community FIRST Robotics teams are a great example of this dream turning into a reality.

More than 60 students from 7th through 12th grade participate on our four community teams. Students come from roughly 20 schools ranging from public, charter, private and homeschool groups. These teams meet weekly throughout the entire year and in peak season may dedicate 10–20 hours a week (or more!) working in the STEM Center. The depth of friendships created around STEM is special to witness, and when you mix in MSOE students, faculty, staff and volunteers, the energy level and sense of community we've created within the STEM Center is incredible.

During our middle school fluid power event, I watched a student from one school stand up and cheer on a competitor school's team. Although attending different schools, the students met and became teammates on one of our FTC community teams. I'd like to think this memorable moment would not have happened without the support from those who made the creation of this STEM Center possible and the community of volunteers who've helped it continue to flourish.

The STEM Center gives students in our community access to programming, develops skills and exposes them to experiences and resources they may not have



had otherwise. While a large amount of our programming focuses on STEM, we have many others that teach tangible skills to students through deeper learning. One example is our Fab Maker Studio, which has been piloted in the past two years as a five-week course in engineering design. Students learn skills ranging from how to create isometric and orthographic drawings to creating a physical prototype from student CAD designs.

These moments are just a snapshot of the impact that has happened because of the STEM Center, and I look forward to you reading more about the important work we do in this report.

Thank you for making the STEM Center a truly one-of-a-kind resource for the Milwaukee community and for giving our team the opportunity to watch students learn, grow and become successful in STEM.

With gratitude,

Liz Taylor
Director of MSOE STEM



DISCOVERING TALENTS & BREAKING BARRIERS



On any given day, Milwaukee resident Aleks Skibicki wears many important hats. “I’m a Girl Scout troop leader, soccer coach and PTO president.” In 2021 he added one more title to his resume: MSOE robotics coach. It’s a role he’s most passionate about. “I studied biology at UW-Milwaukee and have always been an enthusiastic supporter of all STEM areas and helping support my community,” said Skibicki.

Skibicki first heard about the volunteer opportunity during the 2020–21 FIRST Tech Challenge season. He was helping coach his daughter Evie’s team and they practiced weekly at the We Energies STEM Center at MSOE. After spending many hours each week there, he got to know the MSOE staff well. Shortly after, his connection with MSOE became official and Skibicki worked with MSOE staff to add an FTC-level community team to the STEM Center.

Interested in volunteering with MSOE's STEM Center programs? Sign up on our volunteer portal to get notified of upcoming events at bit.ly/stemvols.



“From coding clubs run through local rec departments to FTC scrimmages focused on helping rookie teams prepare for competitions, having Aleks as a volunteer coach for our community teams has strengthened outreach for our FIRST Robotics program,” said Andy Baisch, FIRST programs coordinator at MSOE. “He is not just teaching these students robotics, he’s expanding their opportunities to become active members within their own communities.”

These days, you’ll find Skibicki at the STEM Center each week coaching three different FIRST Tech Challenge teams: Neptune, Storm and ALIEN. As part of his role, he helps guide students in grades 7–12 as they design, build and code new competition robots. As a bonus, he even adds in some business curriculum he learned through his various roles outside of the center. “I enjoy sharing tips on how to run a robotics team, fundraising and the importance of outreach to help build STEM connections in the community,” he said.

Skibicki says the students he teaches come from many different schools and homeschools from across the Milwaukee area, so a big part of the job beyond skill-building involves helping these students gain a sense of belonging and team spirit with their peers they never met before.

“It’s truly the interactions I have with these students that makes this work so rewarding, especially when you see a student discover talents they didn’t know they had and break barriers they didn’t even know could be broken,” said Skibicki.

Skibicki recalls one incredible moment with a new student who had her first opportunity to use power tools. “To see her expression of fear and apprehension quickly change to joy and discovery was inspiring to everyone who witnessed it. A powerful moment both she and I will never forget.” ■

Thank you to our volunteers!

Thank you to all the organizations that provided time to support events at the STEM Center in 2022–23!

- Associated Bank
- Brady Corporation
- Clarios
- Eaton
- Generac
- GE HealthCare
- GRAEF
- Husco
- Hydrite
- Kern Institute, Medical College of Wisconsin
- Milwaukee Bucks
- Milwaukee Tool
- Northwestern Mutual
- Pierce Engineers
- Poclairn
- Regal Rexnord
- Rockwell Automation
- Wisconsin Statewide Health Information Network (WISHIN)
- Yahara



PUTTING COMMUNITY FIRST



It's a surreal feeling for a young person walking into Diercks Hall on a Saturday afternoon to the cheers of hundreds of fans. Team names are being chanted, many of their peers decked out in their team shirts frantically discussing game strategies while referees are busy tallying up scores between matches. While this scene has all the hallmarks of a championship sporting match, the only thing you'll find on the playing fields are dozens of LEGO robots created by 5th–8th grade students from across Milwaukee.



Beginning in 2019, the MSOE STEM team partnered with Milwaukee Public Schools to showcase an annual spring Robotics Scrimmage for MPS and non-MPS students to innovate, engage and compete in an event during the off-season that matches the grandeur of an “official” in-season event.

This event got a boost in 2023 thanks to a new partnership from Regal Rexnord. This year, 150 students from 11 different schools participated. Volunteers from Regal Rexnord helped judge student presentations and projects and ran four competition fields alongside MSOE and community volunteers. This large-scale event takes more than 30 volunteers to help it run smoothly and provide a STEM competition experience that feels like an official FIRST Robotics season event. Thanks to Regal Rexnord and Milwaukee Public Schools, this year’s competition achieved exactly that.

“At Regal Rexnord, we have a responsibility to safety, sustainability, and our community. We are grateful for the positive influence the STEM Center has on the Milwaukee community,” said Joe Hamann, Ph.D., director of engineering at Regal Rexnord. “Our support of the MPS Robotics Scrimmage reinforces Regal Rexnord’s commitment to the development of the next generation’s STEM workforce.”

The MPS Robotics Scrimmage has long served as a culminating opportunity for schools supported by MSOE’s FIRST Ambassadors program, which was founded in partnership with the Argosy Foundation in 2016. Through the FIRST Ambassadors program, MSOE students serve as technical mentors that support robotics teams in high-need schools and community organizations throughout Milwaukee. Since its inception, more than 1,500 students have been a part of programs supported by the MSOE FIRST Ambassadors program. A handful of these students have even gone on to enroll at MSOE and become ambassadors themselves.

Congratulations to the 2023 MPS Robotics Scrimmage winners:

- 1st Place** 53rd Street School “Robotic Tigers”
- 2nd Place** St. Josaphat “Blazers”
- 3rd Place** Golda Meir “Screws Loose”

“The collaboration between MPS and MSOE has breathed new life into our MPS robotics competitions,” said Antonio Rodriguez, STEM curriculum specialist at Milwaukee Public Schools. “This partnership has positioned MPS at the forefront of revitalizing STEM education and equipping our students to thrive in higher education, while fostering their role as valuable contributors to our great community.”

Jonathan Phung, MSOE computer science student, began participating in FIRST programs when he was in middle school. This year marks his tenth year working with FIRST. His STEM experiences within the program helped fuel his passion for learning and teaching others.

“Over the years, I have had the opportunity to volunteer at the MPS Robotics Scrimmage in a variety of positions, including judging and refereeing,” said Phung. “I truly enjoy working with the students and it makes me proud to see their growth and help them celebrate their successes.”

From STEM Center staff to Regal Rexnord volunteers to FIRST Ambassadors and MSOE students like Phung, their efforts make a huge impact on the programs and students. Providing hands-on STEM opportunities like these for K–12 students empowers them to connect, engage and succeed. ■

MSOE student and FIRST Ambassador Jonathon Phung volunteering alongside referee J. Church to help judge the Robotics Scrimmage. MSOE FIRST Ambassadors, like Jonathon Phung and Muhammad Alliyu (pictured bottom left), support FIRST experiences in the community year-round.



GENERAC FLAME — Female Leaders Advocating for Mechanical Engineering (FLAME) is an annual event designed for high school girls to learn about careers and course work in mechanical engineering. Volunteers from Generac helped throughout the day, including assisting students with creating LEGO pneumatic-powered devices.



AGC FOUNDATION — Utilizing one-of-a-kind tools to teach STEM is one of the hallmarks of a STEM Center experience, and the AGC Foundation's ongoing generosity has made this possible through unrestricted giving. Our fleet of artificial intelligence driven robotic hands and robots along with a GlowForge have enabled the STEM Center to run unique, hands-on STEM programs for all ages.



< NORTHWESTERN MUTUAL GIRLS + AI EVENT — Held annually during National Computer Science Week, this event focuses on introducing girls to emerging technologies. Covering topics such as artificial intelligence, coding and robotics, girls get the opportunity to learn alongside professionals from Northwestern Mutual and explore careers in technology.

STEM Center Corporate Partnership Spotlights

We're lucky to have an abundance of corporate partners who support special events and programming within the STEM Center each year. Here are a few highlights from the past year:

< **HYDRITE CANDY CHEMISTRY** — Candy Chemistry, one of the most popular programs at the STEM Center, has gotten a new boost thanks to a partnership with Hydrite. Volunteers helped elementary school students conduct experiments with candy to learn about acids, bases, sucrose and chemical reactions. The event is taught by Dr. Anne-Marie Nickel, MSOE professor.

Our Students by the Numbers

5,800

students served in the 2022–23 programming year.

Of those, **3,500** participated in programs that provided demographic data, showcased in the chart below.

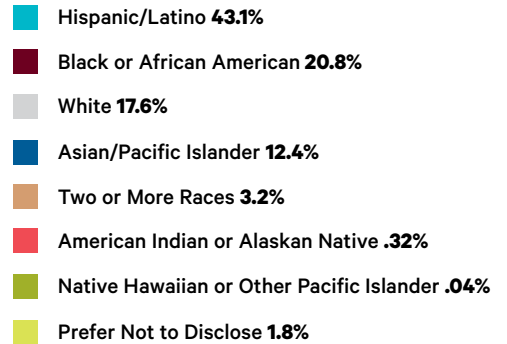


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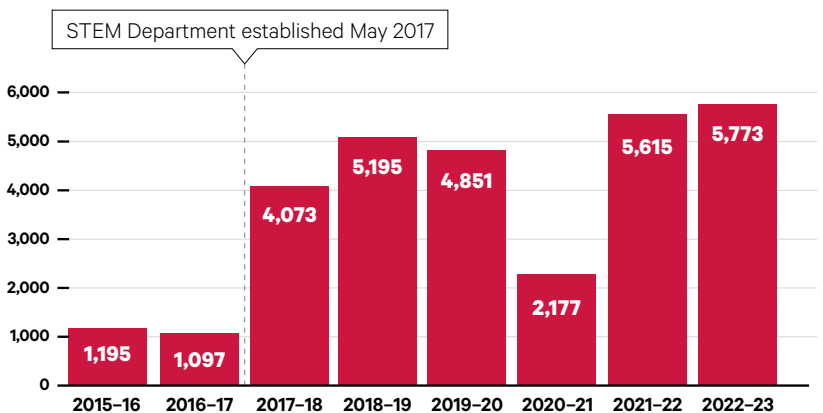
program sessions and events in the STEM Center in 2022–23.

200+

schools across Wisconsin represented by attendees including public, private, charter, and homeschool.



Student Interactions by Year



Milwaukee Cyber Cheese

In only its second year of existence, MSOE's community FIRST Robotics Competition team, "Milwaukee Cyber Cheese," qualified for and competed in the world championships in April in Houston, Texas. Milwaukee Cyber Cheese is a team of students from Milwaukee-area public and private high schools that do not have a FIRST Robotics Competition team of their own. Students on the team are from Golda Meir, Pathways, St. Joan Antida, St. Augustine Prep, Greendale, West Allis Central and Shorewood high schools. Thanks to a crowd-funding campaign, the team raised more than \$17,000 to support their travel, hotel and food costs. Thank you to those who contributed to the STEM Programming Fund in support of Milwaukee Cyber Cheese.

Cyber Cheese extends an additional thanks to NASA, Wisconsin Department of Public Instruction and Harley Davidson for funding during the regular season. We would not have been able to qualify for the World Championship without your support.

- Anonymous (7)
- Cynthia Boyd
- Greg and Liz Casey
- Anthony Cavalco
- CT Cube Inc.
- Lan Deak
- Heather Diedrich
- Patricia Hayes
- Joseph Kultgen
- DeAnna Leitzke
- Ruth LePoidevin
- Cindy McLinn
- Michael Mullarkey
- Karl Nennig
- Northwestern Mutual
- Dave Ody
- Rockwell Automation
- Debra Sakai
- Sue Schmitt
- Elizabeth Sharp
- Elizabeth Taylor
- We Energies

We are grateful to the following donors who have generously supported the We Energies STEM Center at MSOE. While we may have first opened our doors in 2020, this year marks our first report showcasing the impact of these annual gifts. We want to take this opportunity to recognize and thank those who made the STEM Center and its programming possible.

FOUNDING PARTNERS

We Energies

Rockwell Automation

Northwestern Mutual

American Family Insurance

Milwaukee Tool

Scott & Linda Haag

2022-23 DONORS

Argosy Foundation

Rockwell Automation

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American Family Insurance

Milwaukee Bucks & Motorola

AGC Foundation Generac Regal Rexnord

American Association of University Women

To learn more about opportunities to support MSOE STEM, contact Kim Schultz, director of corporate and foundation relations, at (414) 277-7270 or schultz@msoe.edu.



Elementary students participate in Candy Chemistry, the popular STEM program teaches kids how to conduct experiments using candy.



Milwaukee School of Engineering
Office of University Advancement
1025 N. Broadway
Milwaukee, WI 53202-3109