



STEM OUTREACH RESOURCES

The Society of Women Engineers - Detroit Professional Section has developed and maintained this list of STEM (Science, Technology, Engineering, Math) resources for use by parents and educators.

All events, camps, and attractions are located in Michigan with a focus on the Detroit metro area. Details such as prices and timelines are subject to change without notice to SWE - Detroit, however the SWE - Detroit Outreach Committee will take care to update this document annually to the best of our abilities.

As always, please keep up with SWE - Detroit for all our our K-12 STEM outreach events via our website: <http://www.swedetroit.org/outreach.html>

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ENGINEERING EVENTS

[Girls Engineering Exploration by SWE - Detroit](#) - Located at the Michigan Science Center in Detroit, MI. SWE - Detroit hosts hundreds of middle school girls from Detroit Public Schools for a day full of engineering activities and interaction with professional female engineers. Held in March. Cost: Free!

[Detroit Maker Faire](#) - Located at The Henry Ford museum in Dearborn, MI. Maker Faire is a gathering of fascinating, curious people who enjoy learning and who love sharing what they can do. From engineers to artists to scientists to crafters, Maker Faire is a venue for these "makers" to show hobbies, experiments, projects. Known as "the Greatest Show (& Tell) on Earth" - a family-friendly showcase of invention, creativity, and resourcefulness. Held in late July.

[The Robot Garage](#) - Based in Birmingham, The Robot Garage has various Lego and Robotics events throughout the year, including Kid's Night Out events once a month. Cost: \$12 per child, plus optional \$5 pizza dinner

[Michigan Women's Forward - University of Life #UGOSTEMGirls](#) - University of Life is a week-long residential on-campus experience preparing middle school girls for success in high school, college, career and community. With its new focus on helping young ladies understand how their talents relate to high potential careers, U of L is an immersive lesson in entrepreneurship, STEM professions and leadership, with a healthy emphasis on self-esteem, body image, financial literacy and social responsibility.

[Detroit Area Pre-College Engineering Program \(DAPCEP\)](#) - DAPCEP is a nonprofit organization with 39 years of experience partnering with universities, training programs and K-12 school systems in order to connect youth to the best STEM educational experiences in Michigan.

[Michigan Council of Women in Technology \(MCWT\) Camp Infinity](#) - Camp Infinity is a weeklong summer technology camp for girls aged 9 to 13 years old that introduces technology as fun and fulfilling. Takes place in the spring at the Suburban Showcase, Novi. Open to grades 5-8.

[Black Girls CODE](#) - Black Girls CODE is devoted to showing the world that black girls can code, and do so much more. By reaching out to the community through workshops and after school programs, Black Girls CODE introduces computer coding lessons to young girls from underrepresented communities in programming languages such as Scratch or Ruby on Rails. Black Girls CODE Detroit hosts a variety of coding events throughout the year, so be sure to check their website out!

[Engineering Society of Detroit Girls Engineering Academy](#) - ESD will select 30 middle school girls to participate in a remote learning summer and academic year program. The summer experience will engage students over a four-week period, from 10 a.m.–2:45 p.m., Monday–Friday. The program will provide math and science enrichment, engineering and computer science concepts, English/language arts comprehension, hands-on project-based STEM activities, mentoring, virtual field trips to industry, and engineering career exploration. Registration opens in January and closes in May. Summer program will occur late July/early August and will continue with weekend sessions throughout the following academic year. Cost: \$200. Open to grade 5 with GPA of 2.5+ and minimum B average in math and science.

[Girl Scouts](#) – many troops have activities to earn STEM badges. Also, Ford Motor Company sponsors Fast Track events and Scratch Coding with the Girl Scouts in the Detroit area.

UNIVERSITY-HOSTED CAMPS

University of Michigan SWE Student Section Outreach Activities¹

Girls Night Out (early November): middle school girls and their parents to join us for a fun Friday night learning about engineering! Girls will participate in hands-on engineering activities that showcase Michigan Engineering, go on a campus tour, hear from a guest speaker, eat dinner, and meet some amazing women who love sharing their passion for engineering!

Elementary Engineering Exploration Day (Halloween weekend): Coed event that encourages kids to learn more about science and math early on to start building the skills and confidence in their abilities.

Wayne State University K-12 STEM opportunities²

WSU Camp Engineering - The College of Engineering offers several camps from June through August designed to teach elementary, middle and high school aged students engineering and computer and information science skills.

STEM Outreach Program (SOP) - The program targets underserved and minority students to stimulate academic advancement and cognitive development, engaging students and parents in science and mathematical practice, robotics, research, investigation and hands-on activities. Parents are fully involved in the sessions, creating an interesting and effective learning experience.

WSU Engineering and Ford Motor Company Warrior Saturdays - The WSU Ford Warrior STEAM Saturday Challenge will welcome 100 Detroit K-12 school system students and their families to campus to participate in STEAM hands on activities and challenges to benefit the City of Detroit. Participants will spend a total of six Saturdays (three hours each session) learning new skills to expose them to STEAM.

WSU Camp Engineering - Wayne State University's College of Engineering and Department of Computer Science offer several camps designed for elementary, middle and high school students. These camps help students think about careers in engineering and computer science by teaching them skills that are necessary for those fields. Please check back later for camp details!

Kettering University K-12 STEM Opportunities³

Computer Engineering Camp (Day & Residential) - This week long camp exposes students to the field of computer engineering by using technology that is currently being used for developing intelligent systems. They learn how consumer electronics, automobiles and robots are made smart by using microcontrollers embedded in these products. Students design, build and program entry-level microcontroller-based applications, such as robots, and learn how to wire sensors to the processor and implement programs to make their robot intelligent. Students also write Android apps for remotely controlling their robot. Participants receive a microcontroller kit to keep. Open to grades 9-12. Cost: Residential - \$750, Day camp - \$450. Need-based scholarships available.

LITES - Lives Improve Through Engineering & Science (Residential) - Students see how engineers help prevent injuries by designing airbags and child car seats and testing them with crash test dummies. They learn how engineers repair joints, limbs and organs by making replacements that are functional and durable. During the camp, students explore environmental challenges in engineering and solve crimes by combining science and technology. Open to girls in grade 11. Cost :\$1,500. Scholarships available.

¹ (<http://www.swe.engin.umich.edu>, Select "OUTREACH" tab)

² (engineering.wayne.edu/community/k12/opportunities.php)

³ (<https://www.kettering.edu/precollege>)

[SWE Expo \(Residential\)](#) - During this weekend camp, students learn in labs through hands-on activities in Metallurgy, Physics, Chemistry and Biomechanics while making new friends who also love math and science. Participants hang out with Kettering students and learn about their college experience. Open to grades 9-12. Cost: \$75.

Oakland University K-12 STEM Opportunities⁴

Summer/Fall/Winter STEM Camps - Oakland University's School of Engineering and Computer Science, in partnership with the Department of Mathematics and Statistics, offers programs for upper elementary, middle and high school students who want to explore their interest in Science, Technology, Engineering and/or Mathematics (STEM). Dates vary depending on camp. Open to grades K-12. Cost: \$395

[Gen Cyber Camp](#) - The Gen Cyber camp is a comprehensive and activity-based program that delivers substantive cybersecurity training to upper elementary (4th, 5th and 6th grades), middle school, and high school students.

Michigan Tech Summer Camps⁵ *

Junior Women in Engineering - The Junior Women in Engineering (JWIE) program is sponsored by ITC Holdings Corp. and provides an opportunity for academically talented students in grades 6-8 to explore a variety of disciplines, including mechanical, electrical, chemical, civil, and environmental engineering. Held in July. Open to grades 6-8.

Engineering Scholars Program - The Engineering Scholars Program (ESP) is a highly competitive scholarship program that provides an opportunity for students to investigate careers in engineering and science. You will participate in engineering sessions, group projects, and special topic presentations with a diverse group of peers from all over the country and around the world. ESP provides a week-long look at engineering careers in areas like mechanical, computer, environmental, electrical, chemical, biomedical, civil, geological, and materials. Held in July. Open to grades 9-11.

Women in Computer Science - Women in Computer Science (WICS) is a week-long discovery of this fascinating field which is now an integral part of all aspects of our lives. Experience different areas of computing including programming, artificial intelligence, robotics, virtual reality, visualization, networks and security. Learn about the many career opportunities in computing and the excellent job prospects in a wide range of industries. Interact with alumni and role models to get first hand accounts of the diverse careers in computing. Held in July. Open to grades 9-11.

Women in Engineering - Women in Engineering (WIE) program is a highly competitive scholarship program that provides an opportunity for students to investigate careers in engineering and science. You will participate in engineering sessions, group projects, and special topic presentations with a diverse group of peers from all over the country and around the world. WIE provides a week-long look at engineering careers in areas like mechanical, computer, environmental, electrical, chemical, biomedical, civil, geological, and materials. Held in August. Open to grades 9-11.

Women in Automotive Engineering - Women in Automotive Engineering (WIAE) program is sponsored by Dana Incorporated and provides a highly competitive scholarship program that provides an opportunity for talented students to explore engineering careers in the automotive industry, including mechanical and electrical aspects. Program provided in partnership with Michigan Tech's Advanced Power Systems Research Center. Held in August. Open to grades 9-11.

⁴ (<http://oakland.edu/secs/outreach-programs/>)

⁵ (<https://www.mtu.edu/syp/discover/competitive-scholarships/>)

* Note: A variety of scholarships/discounts for Michigan Tech summer camps are available to all students grades 6-11. Applications close in May: <https://www.mtu.edu/syp/discover/other-scholarships/>

LOCAL ATTRACTIONS

[Michigan Science Center](#) - Located in Detroit, MI. The MSC also facilitates the [STEMinista Project](#) created to defy statistics and raise expectations of interest in STEM (science, technology, engineering, and math) for 4th through 8th-grade girls.

[Cranbrook Institute of Science](#) - Located in Bloomfield Hills, MI. First Friday of the month is free admission!

[Impression 5 Science Center](#) - Located in Lansing, MI

[LEGOLAND Discovery Center Michigan](#) - Located in Auburn Hills, MI.

ENGINEERING SCHOLARSHIPS

SWE-Detroit Scholarships ([SWE-Detroit scholarship main link](#))

Scholarship for High School Seniors - Applicants are required to be in their senior year of high school in Michigan. Applicants must be pursuing an engineering degree at ABET accredited engineering program. The minimum GPA requirement is 3.0 (unweighted) and must be a woman or other underrepresented gender in engineering and technology.

Josie Rewald Memorial Community College Scholarship - Applicants must be entering or enrolled in a community college program, studying engineering, engineering technology or computer science or another program but intending to transfer to a degree in engineering, engineering technology, or computer science. Applicants must be Michigan residents and a woman or other underrepresented gender in engineering and technology.

Societal SWE Scholarships ([SWE Societal scholarship link](#))

SWE Scholarships - SWE Scholarships support those who identify as female/ women and are pursuing an ABET-accredited Bachelor or graduate student programs in engineering, engineering technology and computer science globally. SWE has disbursed nearly 260 new and renewed scholarships valued more than \$1,000,000.

Michigan Colleges/University Engineering Scholarships

University of Michigan (<https://www.engin.umich.edu/admissions/finances/>)

Michigan State University (<https://www.egr.msu.edu/academics/undergraduate/scholarships>)

Michigan Technological University (<https://www.mtu.edu/admissions/tuition/scholarships/>)

Western Michigan University (<https://wmich.edu/engineer/scholarships>)

Lawrence Technological University (<https://www.ltu.edu/engineering/civil/jobs-and-scholarships.asp>)

Kettering University (<https://www.kettering.edu/admissions/scholarships-kettering>)

TOYS/GAMES/KITS

Building Toys

[LEGOS](#)

[Keva Planks](http://www.kevaplanks.com) (www.kevaplanks.com ; Amazon)

[Marble Run Toys](#) (Amazon)

[Roominate](http://www.playmonster.com/brands/roominate) (www.playmonster.com/brands/roominate ; Amazon)

[K'Nex](#)

[Magna-Tiles](#) (Amazon)

[Leonardo Building Sticks](http://www.bellalunatoys.com) (www.bellalunatoys.com ; Amazon)

[Snap Circuits](#)

[Blokus Strategy Game](#) (Amazon, Target)

[Pipe Tube Building Blocks](#)

Coding / Programming Toys

[Ozobot](http://ozobot.com) (ozobot.com ; Amazon)

[Wonder Workshop](#) ([Wonder Dash Coding Robot](#); Amazon)

Little Passports - [Create your own Robot](#)

Science Kits

[Early Learners: Learning Resources Primary Science Lab](#)

[Early learners: Educational Insights GeoSafari Jr., My First Microscope](#)

[Elementary School: My First Mind Blowing Science Kit](#)

ONLINE ACTIVITIES

Society of Women Engineers (<http://societyofwomenengineers.swe.org/page/4757-try-cool-engineering-activities>)

Activity #1: Touch Down

Activity #2: Egg Drop

Activity #3: 4-Wheel Balloon Car

Activity #4: Bristle Bots

Activity #5: Plastic Milk

Activity #6: Air Cannon

Activity #7: Robo Wheel

Activity #8: Robo Arm

Activity #9: Recycling Paper

SWENext (<https://swe.org/k-12-outreach/youth-programs/>)

SWENext is a way for girls to become a part of the SWE engineering community as a student through the age of 18. SWENexters have access to programs, mentors, and resources designed to develop leadership skills and self-confidence to #BeThatEngineer and succeed in a career in engineering and technology. Although our program focuses on girls, all students are encouraged to get involved.

DiscoverE (<http://www.discovere.org/our-activities>)

Sorting Solutions

Tape Dispenser Challenge

Coding without Computers

Water Sampling

Rubber Band Rovers

Build a Pinball Game

Launch It

Touch Down

Squishy Circuits

Laser Challenge

Puff Mobiles

Rocket Challenge

Design a Catapult

Lego Structures

Make a Lightbulb

Build a Better Candy Bag

Nanomedicine

Keep-a-cube

Core Sampling

Build a Big Wheel

My Robot Friend

Strong Paper Structure

Make Your Own Glue

Working with Watermills

Building with Biology

Build a Candy Dispenser

Nanosolutions

Tennis Anyone?

Conveyor Belt

Electrical Liquids

Heart Valve Replacement

Safe Landing

Hidden Alarm

Zip Line Challenge

Build a Spinning Top

Levitating Train

Build a High Dive

Build a Bobsled Racer

Dream Big Robot Challenge

Water Pollution Cleanup

Design a Shoe

Design a Dome

Windy City Tower

Waterproof the Roof

Pipe Maze

Design a Flotation Device

Creepy Putty

Build a Straw Bridge

Helping Hand

A Leg to Stand On

Hoop Glider

Solar Heated Water

Dome Home

An Egg-Citing Ride

Oranges and Batteries

Friction in Action

Kinetic Sculpture

Clean it Up

Harmless Holder

Paper Tower

Wind Farm

Product Dissection

Build a Bridge

Slime

Design Squad (<https://pbskids.org/designsquad/>)

Watch: hundreds of videos of “how to” projects for kids

Design: add your design to the site

Build: 50 different projects, with easy to hard ratings

Games: Feed the Fidgets; Fidgets to the Rescue; Don't Flood the Fidgets