

STEM ACTIVITIES

Southeast Michigan

Center for Advanced
Automotive Technology

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Macomb STEM

- Middle and high school outreach
 - Auto STEAM Days enabled 2,700 students to experience hands-on STEAM career-focused activities over two days. Additionally, 500 students and their parents attended an evening event to experience these activities and learn about STEAM careers
 - Partnered with industry:
 - American Axle and Manufacturing
 - Comau
 - Fiat Chrysler Automobiles
 - Ford
 - General Motors
 - KUKA
 - Magna International
 - Siemens



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Macomb STEM

- Middle and high school outreach
 - In-classroom STEM labs offered to 15 middle schools, 134 classrooms, 4,102 students and do hands-on STEM projects. Conducted by CAAT STEM Coordinator.
 - Three hour Career Exploration Labs offered to fifth through ninth graders. Students and parents attend together and do hands-on STEM projects. Conducted by CAAT STEM Coordinator.
 - Summer Academy offers high school students the opportunity to delve into 10 potential career options in a fun and interactive environment. Each summer academy, guided by experts in the field, provides hands-on exploration activities and allows students the chance to experience for themselves what their chosen field has to offer.

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MACOMB COMMUNITY COLLEGE
WAYNE STATE UNIVERSITY

College for Kids

C4K

MACOMB COMMUNITY COLLEGE

Provides educational opportunities and a college campus connection for students ages 3 to 17. Through fun activities and enriching, memorable experiences, students learn and succeed through personal achievement.

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MACOMB COLLEGE WAYNE STATE UNIVERSITY C4K



- Now in its 13th year
- Year round program with largest offering during the summer with week long classes
- Fall, winter, spring classes available on weekends
- STEAM focused
- Classes for students as young as 3 years old
- Partial scholarships may be available
- Classes available for schools and scout groups

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STEAMs ahead

- App Development
- Blast Off Rocketry
- Code Breakers and Adventures
- Energy Makers
- Goldie Blox Engineering for Girls
- LEGO® Engineering
- Maker Labs
- Pullback Car Frenzy
- ROBLOX®
- Small Engine Repair for Teens
- Tiny Tunes Piano
- Toy Design
- 3D Video Game Design
- Virtual Reality



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Information

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Visit www.macomb.edu/youth

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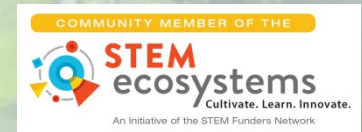
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Michigan STEM Partnership

Michigan STEM Partnership

- Statewide nonprofit organization
- Provides strategic support for systems development, resources, and programs
- Provides for the effectiveness and sustainability of STEM education and talent development
- Backbone organization for the Southeast Michigan STEM Alliance



Southeast Michigan STEM Alliance

- 7 county regional STEM Ecosystem Community of Practice. One of 56 Ecosystems in North America through the STEM Funders Network.
- Regional STEM Leadership Council and Regional Input Network
- Mobile STEM Lab and Training Center (in development)
- STEM Educator Professional Development
- Innovative Problem Solving for STEM

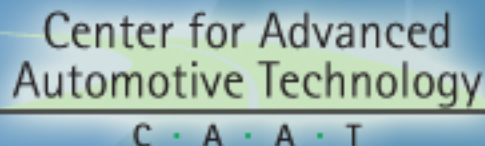


Michigan STEM Career Video Showcase

- Self created 3-5 minute videos featuring STEM professionals describing their career, preparation requirements, career opportunities, and joys and rewards of their work
- Hosted on the Michigan STEM Partnership website



Other Collaborative System Building and Programmatic Initiatives





- *Square One Education Network (Square One) is the leading K12 Science, Technology, Engineering and Math organization providing real world, hands on content that directly serves Michigan's most important industry. Square One was doing STEM in Automotive Mobility before STEM was cool!*
- *Square One's model is to provide innovative and engaging content to teachers, who then use their talents and training in the classroom to inspire students about the future of the Automotive Mobility Industry, widely recognized as the most exciting technology of the future.*
- *That is, some students enjoy Automotive Mobility related STEM, they are good in its subjects, and enjoy taking things apart and putting them back together. Not everyone has all of these characteristics. However, Square One's content helps to find these people by putting it in teacher's hands in the classroom and letting teachers use their skills to provide that spark. Teachers are the most important mentors in Square One's model.*
- *In turn, these skills help qualify students for higher education opportunities in colleges, universities and trade schools to eventually be qualified for a successful career in Michigan.*
- *Once sparked, students have opportunities to participate in challenge competitions in our subject matter, including:*
 - *underwater robotics,*
 - *building electric powered vehicles from the ground up,*
 - *programming autonomous technologies by reverse engineering small scale electric vehicles,*
 - *mechanical engineering in small scale radio-controlled vehicles racing,*
 - *working in connected vehicle technology to electronically connect to other vehicles and to the surrounding infrastructure (also known as, the "Internet of Things"),*
 - *and others.*
- *There are almost 40,000 traffic deaths in the United States every year. Square One is the only organization actively providing direct content in K12 that teaches the technology that will be used in the future to prevent traffic fatalities. Of the 40,000 traffic deaths, roughly 8,000 are teenagers.*
- *Square One would like to see all high school graduates understand that the Automotive Mobility Technologies of the future, combined responsibly, can provide a substantial societal benefit.*
- *Please feel free to contact Square One for more information by visiting their website www.squareonenetwork.org or calling 248.736.7537.*





FIRST[®]
in Michigan

FIRST[®]
LEGO[®]
LEAGUE JR.

FIRST[®]
LEGO[®]
LEAGUE

FIRST[®]
TECH
CHALLENGE

FIRST[®]
ROBOTICS
COMPETITION

STEM ACTIVITIES

FIRST in Michigan

Center for Advanced
Automotive Technology

4/23/2018 C A A T



FRC Team #862: Lightning Robotics
Plymouth-Canton Educational Park



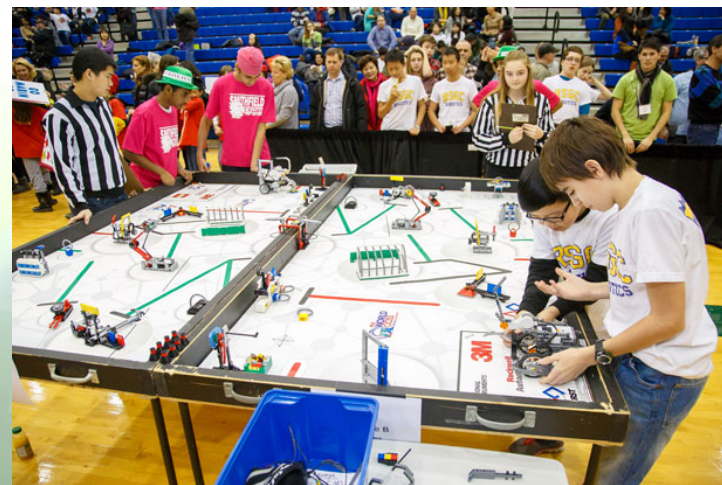
FIRST Lego League Jr.

- Grades K through 3
- Runs year-round
- Max of 10 students per team
- Students discover the wonders of science and technology.
- Objectives:
 - Research a topic
 - Design and build a LEGO® model
 - Create poster presentation
 - Attend an FLL Jr. Expo and present their research to judges



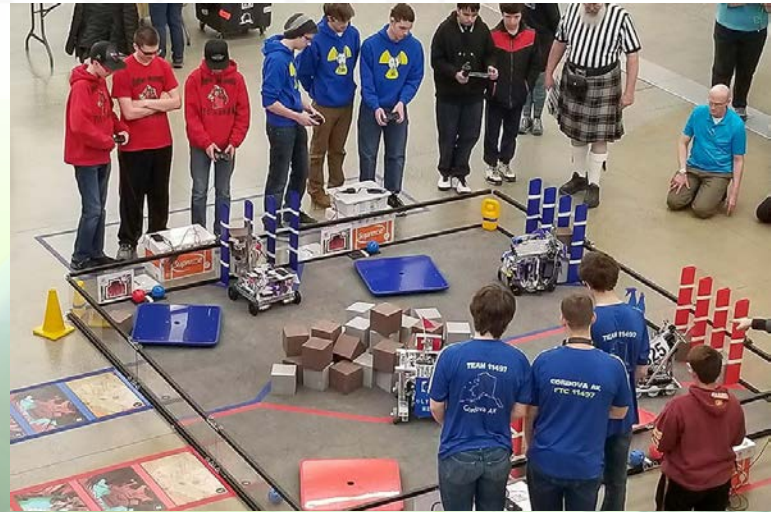
FIRST Lego League

- Grades 4 through 5
- August – December
- Max of 10 students per team
- Students expand upon their science and technology knowledge.
- Objectives:
 - Build and program an autonomous robot
 - Score points with robot during the year's game
 - Create and present innovative solutions to a problem



FIRST Tech Challenge

- Grades 6 through 8
- September – December
- Max of 15 students per team
- Students develop STEM skills and practice engineering principles.
- Objectives:
 - Design, build, program, and operate robots
 - Compete with 18"x18"x18" robots at District and State competitions
 - 2v2 alliance format
 - Present to judges at FTC events



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4/23/2018



FTC Team #862: Lightning Robotics
Plymouth-Canton Educational Park

FIRST Robotics Competition

- Grades 9 through 12
- January – April
- Students combine the excitement of sports with the rigors of science and technology.
- Objectives:
 - Design, build, and program robots
 - Compete with 120-pound robots at District and State Competitions
 - 3v3 alliance format
 - Work alongside professional engineers



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FRC Team #862: Lightning Robotics
Plymouth-Canton Educational Park

Opportunities gained from participation in *FIRST*

- Access to over \$70,000,000 in exclusive scholarships
- Hands-on learning and teamwork skills
- STEM and business skills
- Professional mentoring and networking
- Potential internships
- Competing with other students from around the world
- Unique preparation for the workforce



In 2018, the *FIRST* Championship will be hosted in Detroit, Michigan at Cobo Center from April 25th to April 28th.

The event is free and open to the public!

FIRST website: <https://www.firstinspires.org>

FIRST in Michigan website:
<https://www.firstinmichigan.org>



Oakland Schools STEM

- Middle School STEM Summer Camps
 - Middle schoolers participate in hands-on, project-based learning and enables students to experience culinary arts, engineering, health sciences, information technology, robotics and visual imagining
- Family Engineering Nights
 - Parents inspire and explore engineering with their child (ages 10-15) to become part of the next generation of critical thinkers and problem solvers

OaklandSchools

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cfe@oakland.k12.mi.us



Oakland Schools STEM

- Oakland County Competitive Robotics Association (OCCRA)
 - OCCRA generates enthusiasm for technical and academic disciplines such as design, engineering, physics, and electronics. These competitions provide recognition and encouragement for students who devote their energies to these areas of studies.
- CSI: Oakland
 - CSI: Oakland creates authentic learning experiences for high school students by staging crime scenes where the teams engage in the challenge of Forensic Science.
- Oakland Schools Technical Campuses (OSTC)
 - Four technical centers in Oakland County (Clarkston, Pontiac, Wixom, Royal Oak) offering CTE programs including Mechatronics, Programming, Networking, Cybersecurity, Health Sciences, etc.

OaklandSchools

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cfe@oakland.k12.mi.us





- Each year, Macomb County Department of Planning & Economic Development and the Macomb Intermediate School District partner to host a countywide celebration of national MFG Day. (MFGDay.com). Over the last five years, more than 6,000 students have visited a local advanced manufacturing plant to see the industry in action and meet people who make things.
- Over the years, host sites have gotten very good at hosting tours. Post-participation surveys of students demonstrate that this is a great learning experience and helps students of all backgrounds consider the wide range of jobs available in the industry.
- The event is free. Reimbursement for bus travel is provided. To learn more, visit www.ManufactureMyFuture.com or get in touch with your district's CTE director.



DAPCEP

Science • Technology • Engineering • Math

Programs for students in grades Pre-K through 12



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Executive Director, Michelle L. Reaves

DAPCEP Overview

- DAPCEP (Detroit Area Pre-College Engineering Program) is a nationally recognized non-profit organization providing Science, Technology, Engineering & Math (STEM) programming to Pre-K through 12th grade students for over 40 years.
- DAPCEP's mission is to increase the number of historically underrepresented minorities that are prepared to pursue STEM professions.
- DAPCEP serves over 8,000 students annually in out-of-school time programs.
- Programs are facilitated on university and corporate campuses, providing youth hands-on opportunities in technical environments.

100%
Graduation Rate



49%
Female Participants



Areas of Engagement

Elementary

Explorers

The DAPCEP Explorers curriculum is correlated with national education standards and is designed to develop key school and life readiness skills such as critical thinking, creativity, confidence, communication and collaboration.



Middle School

Pathfinders

Pathfinders discover their passion and career aspirations by participating in a broad variety of learning modules on university and corporate campuses.

Pop-Up Workshops

Pop-Up workshops are designed to peak curiosity and bring awareness to a variety of STEM topics.

In-School

STEM project-based learning and teacher professional development.

High School

Residential Summer Programs

Students live and learn on a university campus. Residing in dorms and participate in specially designed advanced STEM courses and laboratories during the day.

Talents Tours & Bridge Program

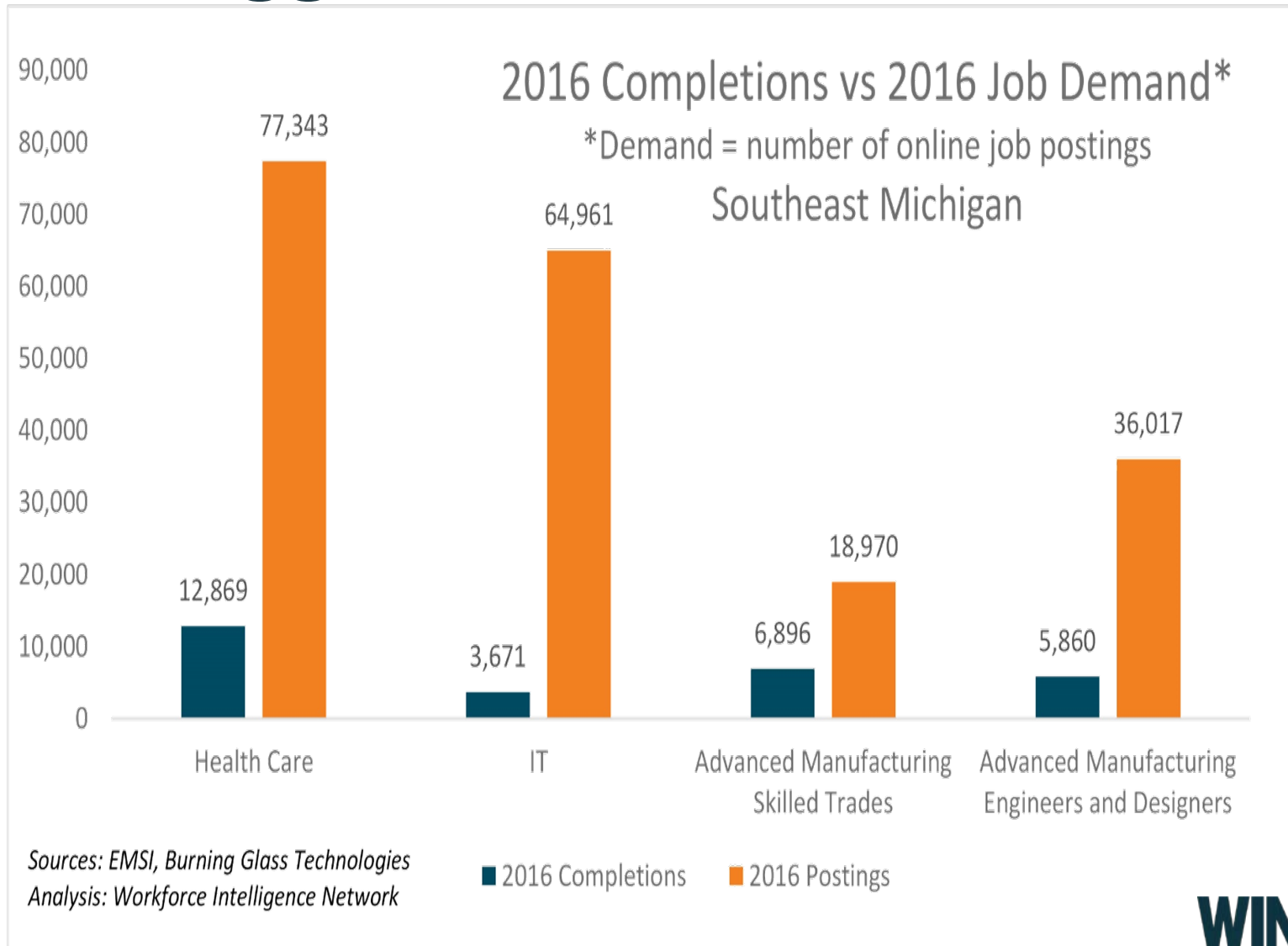
DAPCEP Talent Tours introduce youth to available career paths in specific STEM fields.



MI Bright Future

Building partnerships between employers and K-12

The struggle is real



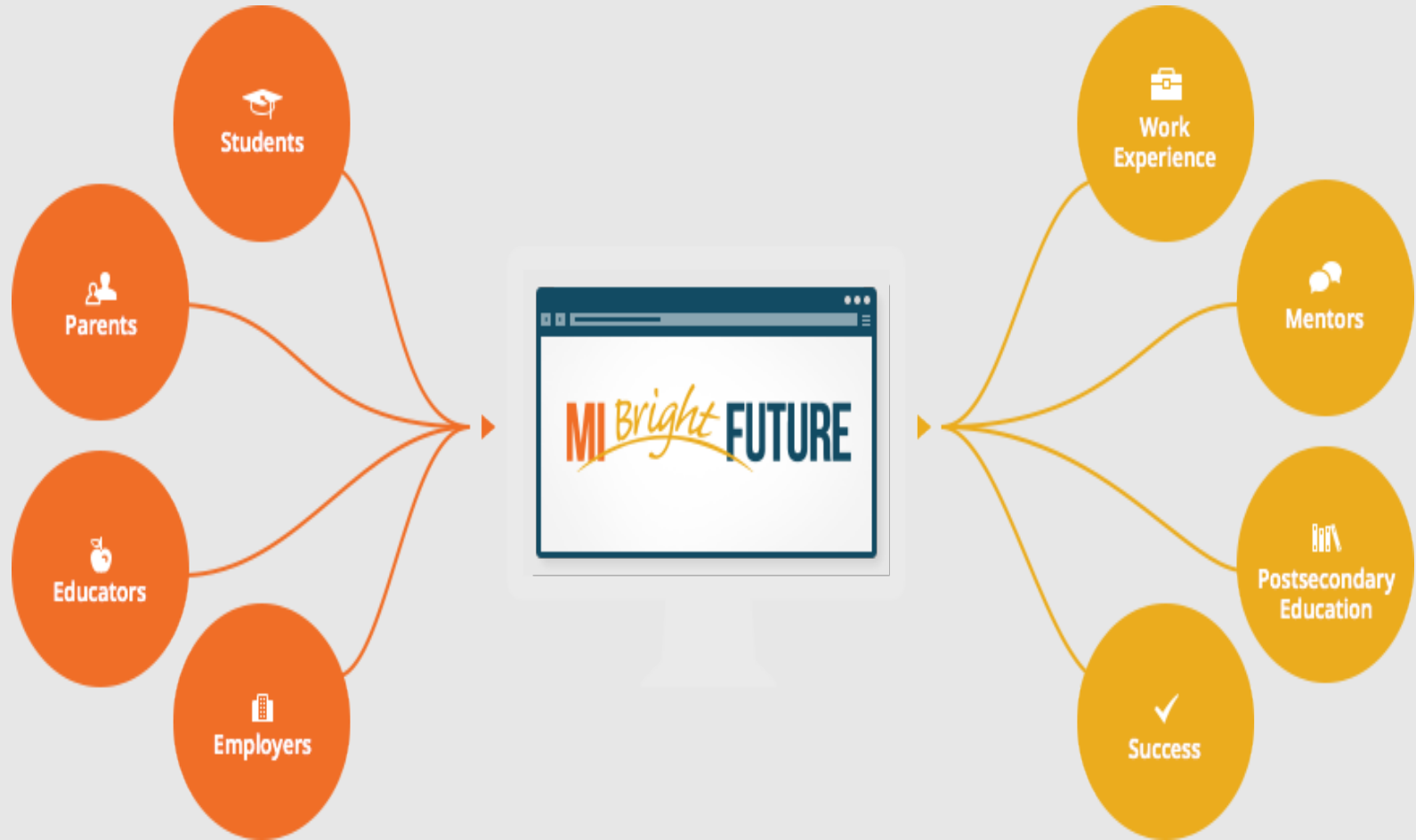
Career Interest

142,454 HIGH SCHOOL & MIDDLE SCHOOL STUDENTS

Livingston, Macomb, Oakland, St. Clair & Wayne Counties

Occupation	All-Time Student Saves	All-Time Student Saves (Male)	All-Time Student Saves (Female)
Professional Athlete	11,407	9,146	1,942
Actor	6,856	1,971	4,581
Video Game Developer	6,652	5,571	882
Doctor	6,030	2,101	3,635
Nurse	5,803	521	4,947
Artist	5,532	1,641	3,604
Veterinarian	5,091	1,050	3,752
Animator	4,914	2,417	2,252
Lawyer	4,835	1,836	2,734
Pediatrician	4,543	412	3,823
Psychologist	4,430	710	3,422
Fashion Designer	4,350	473	3,640
Photographer	4,346	873	3,179
Singer	4,141	802	3,140
Musician	4,016	1,765	2,090
Surgeon	3,905	1,263	2,423
Athletic Therapist	3,667	1,925	1,572
Child and Youth Worker	3,635	265	3,127
Elementary School Teacher	3,604	260	3,100

MI Bright Future



EMPLOYER/VOLUNTEER SUMMARY

**391
Companies**

**628
Career
Coaches**

**2,362
Work-
based
Learning
Activities**

MI BRIGHT FUTURE MISSION

Build partnerships with local professionals and companies in Michigan to provide middle and high school students with meaningful workplace experiences



- The **American Society for Body Engineers Foundation** (asbe Foundation) has been in existence since 2003. The Foundation is a 501c3, all volunteer, organization staffed by automotive professionals and technical educators.
- **Purpose**
Promote careers in automotive styling, design and design engineering through tours and competitions for high school students and to provide professional development for professionals in the field.
- **Design Challenge High School Contest**
- **College Scholarships**
- **Autorama - Display Encouraging Creative Technical Careers**
- **Plant and Technical Tours**
- **Michigan Industrial Technology Education Society (MITES) Creativity Award**
- **Teacher Workshops – Current Industry Tools and Trends**



Governors Award



Design Challenge Finalists



Design Challenge First Place
and Teacher



Teacher Training Seminar



FORD
NEXT GENERATION
LEARNING 
Education Innovation

Supporting Community Connected Learning and STEAM Initiatives in Southeast Michigan



FORD
NEXT GENERATION
LEARNING 
Community Connected Learning



| FORD MOTOR COMPANY FUND





EDUCATION IS PART OF THE DNA OF FORD



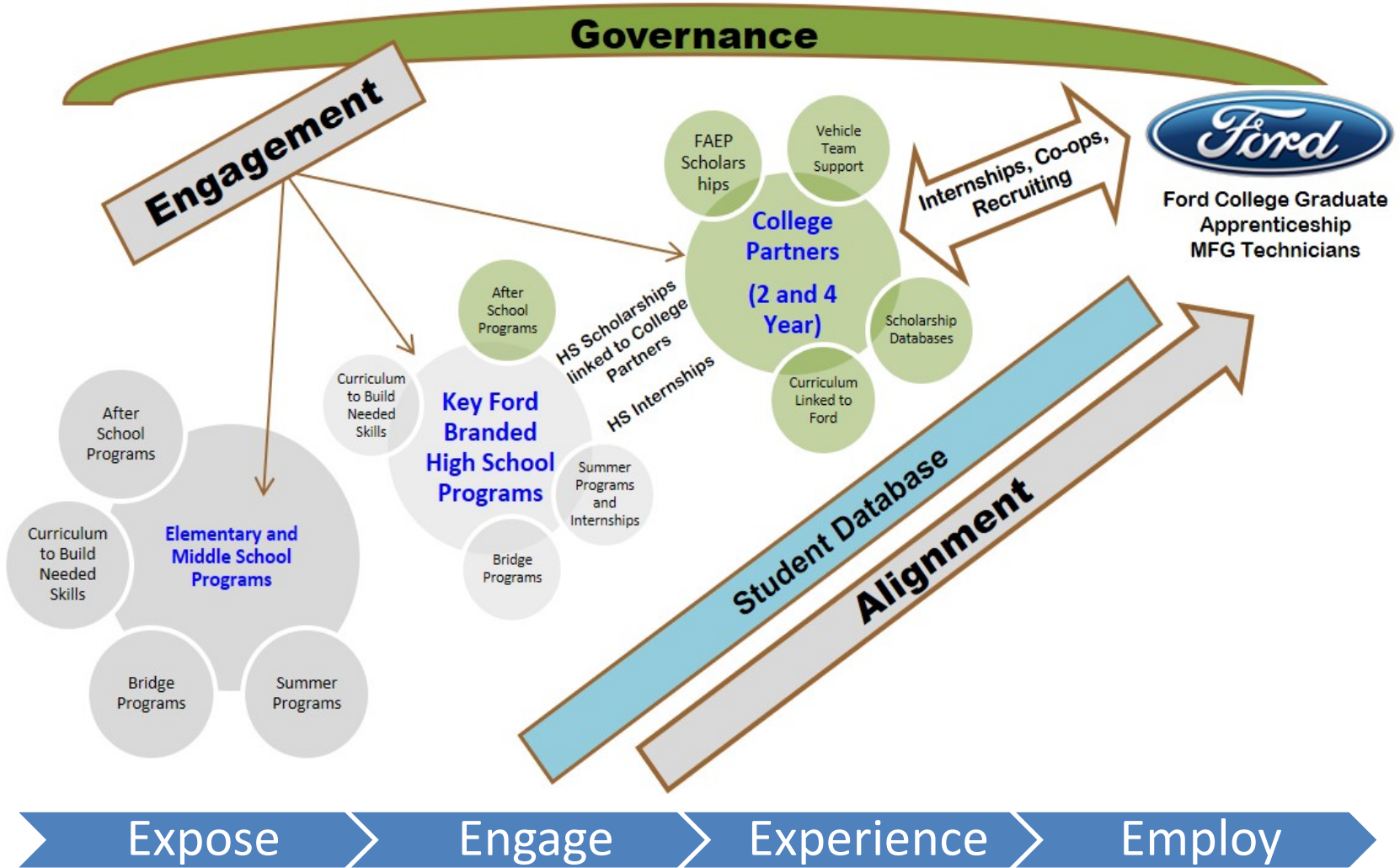
**FORD
NEXT GENERATION
LEARNING**
Community Connected Learning



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Ford Motor Company STEAM Pipeline Strategy



3 MAIN OUTCOMES



IMPROVE
STUDENT
OUTCOMES

SOCIAL MOBILITY

IMPROVE
WORKFORCE
OUTCOMES

IMPROVE
COMMUNITY
PROSPERITY



FEATURED INTERNAL FORD PARTNER PROGRAM

Ford Next Generation Learning (NGL) Academies

Ford Motor Company is sustaining more than \$30 million of investment over the next five years working with Ford NGL's blue chip scale, and supporting communities with a framework, transformation, United Kingdom fully prepared

**FORD NGL MOBILIZES
EDUCATORS, EMPLOYERS, AND COMMUNITY LEADERS
TO PREPARE
A NEW GENERATION OF YOUNG PEOPLE
WHO WILL GRADUATE FROM HIGH SCHOOL
READY FOR COLLEGE, CAREERS, AND LIFE
—PREPARED TO COMPETE SUCCESSFULLY
IN THE 21ST CENTURY ECONOMY.**

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spent the last 12
The result is
actively support,
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of the career



**FORD
NEXT GENERATION
LEARNING** 
Community Connected Learning



FORD MOTOR COMPANY FUND



CAREER ACADEMIES

CONNECT RIGOROUS, COLLEGE PREPARATORY
ACADEMIC COURSES WITH CAREER THEMES
IN AREAS SUCH AS ENGINEERING, MANUFACTURING, IT,
HEALTH, DIGITAL MEDIA AND OTHER
HIGH DEMAND CAREER
PATHWAYS —————

FEATURES &

FEATURES	BENEFITS FOR STUDENTS	BENEFITS FOR FORD & NGL COMMUNITIES
Stronger academic achievement & 21st century skills	Better prepared for college and career	New hire already has exposure and contacts
Work-based learning experiences	Post-secondary more affordable	Minimal training or retraining
College credit and/or industry certifications	Invaluable social capital	Know the background of new hire
Develop 21st Century skills	Student more marketable	Less coaching on workplace skills
Career pathway exposure	Understands what it takes to be successful	Students is familiar with work

BENEFITS

Powered by Ford STEAM Academies in SE Michigan

- Macomb County
 - Center Line High School-Industry, Technology, and Innovation Academy
 - Romeo High School-STEM Academy
 - Utica Center for Science and Industry
 - Utica-Stevenson HS.-Center for Manufacturing, Automation, Design and Engineering (MADE)-Opening in Fall 2018
- Wayne County
 - Cody-Detroit Institute of Technology (DIT)
 - Frederick Douglass Academy for Young Men
 - Henry Ford Early College Advanced Manufacturing Academy

Ford STEAM EXPERIENCE

<https://social.ford.com/content/ford-steam/>

Ford Next Generation Learning

<https://www.fordngl.com/>

Scott Palmer, Community Coach

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Patrice Washington, Student Relations and STEAM Coordinator

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| FORD MOTOR COMPANY FUND



Examples of MTAM STEM-RELATED PROGRAMS and INITIATIVES

MTAM Student Chapters

An opportunity for students, educators, and businesses to interact about mobile/wireless technologies in a hands-on environment.

Includes opportunities for:

- student chapters across the state to compete in competitions designed to promote learning
- students gain access to business environments thru tours, job-shadowing, internships, hands-on demo's and more
- businesses gain the opportunity to showcase their technologies
- businesses gain the opportunity to access upcoming talent , evaluate them for internship & job opportunities

GoMobileMichigan.org/StudentChapters



Student Chapters

Explore the Possibilities!



Help prepare students for mobile/wireless tech jobs across all industries. Support MTAM Student Chapters.

Now Accepting:

- Program sponsors
- Chapter host applications from schools / colleges
- Businesses wanting to participate w/ content for access to students

Visit our website for more information

GoMobileMichigan.org/StudentChapters

info@GoMobileMichigan.org

STEM Careers Video Showcase Initiative

A joint initiative from the MI STEM Partnership, Mobile Technology Assn of MI (MTAM) and Inforum, the MI STEM Careers Video Showcase features self-produced videos from STEM professionals across a wide diversity of industries throughout Michigan.

Video Content Includes:

- the work they do
- the type of education required
- what they love about their job
- the “opportunity” from their perspective (*ie: why students should pursue this career*)



Help Develop the Next Generation STEM Workforce

You're invited to participate in a joint initiative from the **Michigan STEM Partnership**, the **Mobile Technology Association of Michigan (MTAM)** and **Inforum** that will:

- showcase the excitement of STEM careers in Michigan,
- encourage today's students to consider careers in STEM
- increase parent-awareness of the value of STEM careers for their children – particularly females and minorities who are currently severely under-represented
- provide educators with a tool they can use as part of their curriculum
- provide Michigan firms an opportunity to showcase their companies and their employees as a potential recruitment tool
- provide STEM employees across every industry in Michigan an opportunity to showcase their expertise

We're asking STEM Professionals in every industry to volunteer to submit a 3- 5 minute self-made video (*cellphone / tablet*) of themselves talking about their work in order to help excite today's students into becoming tomorrow's STEM Workforce.

Just a few minutes of your time could change the lifetime career direction of a student and help your industry with future recruitment!



Get participation details at:

MISTEMPartnership.com/VideoShowcase

Learn More About Connected Technologies, Their Role in Michigan, or MTAM Programs & Initiatives

Visit our webpage at:

GoMobileMichigan.org

Email us at:

info@GoMobileMichigan.org

Scan the code to the right to access our
Information Request Form



<http://GoMobileMichigan.org>