Oxford High School *Oxford, MI*

FIRST ROBOTICS COMPETITION

T.O.R.C.

TEAM 2137

Chairman's Presentation

2018 - 2019

FIRST LAUNCH

DESTINATION: DEEP SPACE

Presented By BOEING

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***FIRST*® Robotics Competition Team 2137**
The Oxford RoboCats – T.O.R.C.

2019 Chairman's Award Executive Summary

Team Number

2137

Regional Selection

Michigan

Team Name

T.O.R.C.

Corporate/University Sponsors:

Adobe, FCA Foundation, ARC Investment, Michigan Department of Education, Oakland Orthopedic Surgeons, CEC Controls, DBS SolidWorks, SMC Corporation of America, CAMS, Valeo, Kettering University, Oxford Community Schools, Pillar Designs, Quality Fastener and Supply, The Home Depot, J & T Electrical Supply

Describe the impact of the FIRST program on team participants within the last five years

TORC helps students gain different sets of skills from engineering and fabrication to business and leadership skills. Students gain self-confidence by training in the shop and are assisted in resume writing and interviewing skills. Our Alumni to date have earned $1.2M+ in scholarships and 94% of TORC alumni went into STEM degrees. Three student alumni have also started their own businesses.

Describe the impact of the FIRST program on your community within the last five years

TORC impacts our community through education and charity events. We worked with our district to create the OHS Academy of Engineering and Technology which implemented 15 STEM courses and 3 middle school pre-engineering courses. Our most impactful event to date is coordinating a water drive for Flint during the lead crisis. As a team, we are always learning the importance of serving our community and in doing so, we are able to carry what we learn forward to impact the future of our world.

Describe the team's methods for spreading the FIRST message in ways that are effective, scalable, sustainable, and creative

TORC spreads the message of FIRST by inspiring others to join the community in the appreciation of STEM. We have a close partnership with our local paper, The Oxford Leader, where they publish articles about our activities and events throughout the year. We love to invite our local public news broadcasting group, OCTV, to our local FRC and FTC events. At our school we are recognized at the Meet the Teams Night. At a home basketball game we bring one of our robots to shoot hoops during halftime.

Describe examples of how your team members act as role models and inspire other FIRST team members to emulate

As a veteran team, TORC acts as a role model through how we interact and assist other teams on and off the field. We share mature practices such as our 5 level machine certification system and our developed process of collecting scouting data. We lead by example by helping other teams learn to solve problems through our assistance and direct team to team cooperation.

Describe the team's initiatives to help start or form other FRC teams

TORC inspires educators, government officials and businesses to help form FRC teams. In 2014, TORC made a proposal seeking funds for FRC teams that brought Michigan Department of Education Grants. As a result, 50 new teams were formed. TORC also gives assistance to teams in other school districts by providing published resources, hosting a Week 0 event (with an open machine shop, services and supplies) and by providing sponsorship guidance.

Describe the team's initiatives to help start or form other FIRST teams (including Jr. FLL, FLL, & FTC)

TORC students and mentors travel to schools to give robot demonstrations and talk about the FIRST programs and STEM. Over the summer we partake in community events to spread the message of FIRST. We provide fliers with information about the programs and our contact information if they have any questions or need help with starting a team of their own. Last year one of our visits inspired a teacher and parents to start their first FLL team, 43958 the Riverside Jags, for the 2018-2019 season.

Describe the team's initiatives on assisting other FIRST teams (including FIRST LEGO League Jr., FIRST LEGO League, & FIRST Tech Challenge) with progressing through the FIRST program

TORC members volunteer as mentors and judges for lower level teams in our school district. We volunteered and hosted 2 Jr.FLL and FLL events, and volunteered at 3 FTC events. At the Oxford FTC kickoff event TORC students volunteered as topic presenters. The student presentations helped both rookie and veteran teams prepare to compete this season. After the FRC kickoff we host a team strategy session to help local rookie and veteran teams.

Describe how your team works with other FIRST teams to serve as mentors to younger or less experienced FIRST teams (includes Jr. FLL, FLL, FTC).

Our mentorship includes on-site assistance, online postings, materials, knowledge and role models. Students mentor FIRST teams and help with fundraising opportunities. Since TORC's assistance has been implemented in our district Jr.FLL/FLL teams have grown, and FTC teams have quadrupled. By partnering with other FIRST teams we assisted FRC 3536 at 2 FTC events and FRC 217 at 1 FLL event by supplying volunteers. We worked with our Oxford Robotics community to mentor Jr.FLL, FLL and FTC teams.

Describe your Corporate/University Sponsors

TORC's Sponsors are individuals and organizations who have partnered with us to reach the goal of achieving the FIRST mission. They assist us with funds, materials, and services. More importantly, they extend to us their name and reputation. We have 99 sponsorship sources from 2014–current:

Auto/Tech	$83,604+
School District	$40,800+
Foreign	$3,000+
University	$12,500+
Small Businesses/Retail	$28,300+
Government	$48,352+
Alumni/Family	$8,155+

Describe the strength of your partnership with your sponsors within the last five years

TORC and its sponsors have a strong partnership. Our sponsors have supplied support for 5+ years, provided 11 student recognition awards, 12 scholarships, 18 internships, painted 4 TORC robots, and provided an open space to house our practice field during the season. In return TORC provides tours of our facility and robot demo's, tours sponsor facilities, and supports sponsor events.

For FIRST Robotics Competition teams older than 5 years, briefly describe your team's broader impact from its inception

TORC started with 1 mentor and 5 students, and now has 24 mentors and 38 students. Our team ensures that students lead in decisions and implementation of their designs. We have gone from being robot-focused to engaging with our community. In TORC our student leads help the growth of our team and our community. As student leads we assist lower level and FRC teams. As leads become alumni they go on to help teams of their own. We have helped 14+ rookie and 10+ veteran teams.

Describe how your team would explain what FIRST is to someone who has never heard of it

FIRST is hard fun that exposes students to future possibilities. FIRST gives students confidence and the ability to set and achieve long-term goals, fosters a positive environment that promotes STEM and intellectual growth, helps students gain an understanding of the application of STEM concepts, builds a network that opens options to internships and career opportunities, nurtures meaningful relationships, encourages students to engage with their community and inspires creative problem solving.

Briefly describe other matters of interest to the FIRST Judges, if any

On TORC every interested student is given an equal opportunity to participate. We encourage involvement from every student regardless of their background. We have involvement from students who are enrolled in traditional, virtual, homeschool, international and special education. Our students go through an application, resume, and interview process to develop soft skills. To develop technical skills, we have implemented a machine certification program to ensure the safety of our students.

FIRST® Robotics Competition Team 2137
The Oxford RoboCats – T.O.R.C.

2019 Chairman's Essay

T.O.R.C. brings our students, mentors, community, and competitors together to inspire future leaders, innovators, and problem solvers. We are changing the culture from a robot-focused group to a team that celebrates science, technology, engineering, art, and math. Since 2007, we have grown from a team of 5 students and 1 mentor to a team of 38 students and 24 mentors. In a continuous cycle of learning and problem solving we as individuals and as a team are able to transform the future of the world.

To start that cycle we first focus on providing our students with needed knowledge and tools. In T.O.R.C., we have created a student-led environment that encourages the learning and development of critical skills and concepts. We encourage student involvement in technical areas regardless of their level of experience. Students are able to engage in programming by learning Java and LabVIEW. In fabrication and CAD, students learn how to operate machines professionally. Not only do members learn technical skills but they also learn key soft skills. Students are given opportunities to develop written, media and oral presentation skills by creating our team newsletter, brochures, and videos. Our students benefit from the skills they learn which aid them in obtaining scholarships and internships. For example, a fourth-year student interned at Valeo after they recognized the value in our machine certification system at one of our competitions. The student that created our system, implemented a modified version in their facility. With these experiences, our members are able to become strong communicators and leaders.

Like the real world, our leaders go through an application and interview process. Our mentors are comprised of engineers, teachers, and professionals from our community. They select captains who lead the team in robot design/build and communication/logistics subgroups. This approach allows us to execute student-driven projects. Mentors and student captains aim to ensure adherence to timelines, engineering processes and facilitate group meetings. Through these hands-on experiences, our innovators and problem solvers gain abilities which inspire them to become leaders.

Using these skills, T.O.R.C. students gain self-confidence to become leaders and are inspired to spread the message of FIRST®.

Through FIRST, T.O.R.C. members continuously help by dedicating countless hours to assist in the formation

and growth of rookie and veteran teams. During build season, T.O.R.C. helps with the fabrication of robot components, refinement of programming, and donation of supplies. We assist teams at competitions; enabling them to compete year after year by helping pass inspection, resolving pre-match coding bugs and more. We also assist newer teams with match planning, scouting strategy as well as alliance selections. T.O.R.C. has put an emphasis on mentoring young teams such as 5155, by committing Sundays and many hours to help with programming and electrical issues during their early years. We also aided the rookie Team 6136 by building a climber for their robot which they were able to compete with at the week 1 Southfield event. Since 2013, we host an annual Week Zero practice event. We provide each team a pit to work from, access to our machine shop, supplies, and a practice field set up for testing and mock matches. Since the start of this event, we've helped 10 rookie teams complete their robot.

T.O.R.C. supports other teams year round on and off the field. In 2017 one of our student captains was accepted into the FIRST Robots in the Outback program (RITO) traveling across the Outback, sharing their experience and spreading the message of FIRST. The students in these remote communities will benefit from a new vision of future possibilities and a desire to learn more about STEM. The mentors will grow from within, expanding their own knowledge, creativity, and innovation along the way. Last year a student, and mentor had the opportunity to travel and volunteer at the FIRST Global Event in Mexico City. In addition to helping teams around the globe learn more about FIRST, this opportunity opened relationships and connections to other teams around the globe.

This year we aspired to increase our involvement and to further develop bonds with the Jr.FLL, FLL, and FTC teams in our district. Several of our students provided assistance across our younger teams during their 2018 season with one student providing dedicated mentorship to 2 FLL teams through their competitions. These bonds allow us to inspire a lasting interest for STEM to facilitate and sustain FIRST in our district. FIRST has been represented in all 7 of our district schools. From this growth, we recognized the need for new space. From a new partnership with a sponsor, we have been able to obtain a nearby space for the Jr.FLL, FLL, and FTC to use during their next season. This space, along with T.O.R.C. student assistance, ensures sustainability and allows for continued growth of FIRST in our district and community.

T.O.R.C. engages with students, charities, businesses and our community to help the world. Through volunteer service, we contribute to a multitude of humanitarian efforts, like the Susan G. Komen Walk for a Cure. We've broadened our impact globally by gathering glasses and hearing aids for India, collecting thousands of pill bottles to be sent throughout Africa for safe medication distribution, and filling hundreds of shoeboxes through Samaritan's Purse to be distributed to kids in need across the globe.

Closer to home, we recognized the water crisis affecting Flint, MI and initiated a community water drive in 2016. Utilizing multiple media outlets to rally other FIRST teams, our community, sponsors and businesses, we were able to procure over 3,100 gallons of water. Eight FIRST teams and community volunteers met at Kettering University and traveled to Foss Avenue Food Bank for distribution. Our efforts enabled Flint residents to safely shower and cook during this crisis.

In 2014, as entrepreneurs, we helped jump-start a STEM-focused business, Brick It Up, in our community. T.O.R.C. met with Brick It Up, a LEGO® based educational facility and Kettering University to create a curriculum that T.O.R.C. members continue to enhance. Classes are held at Brick It Up and at schools. As a result, Brick It Up has hired 4 members who have introduced more than 3,000 students to robotics, engineering, and animation-based programs. We strive to bring awareness and opportunity to the community around us by strengthening current relationships and building new ones.

In addition to our humanitarian efforts, we work with our school district to expand learning experiences and interest in STEM. We have reached over 4,000 students, Pre-K to 8th grade, by offering robot demonstrations, workshops, and engineering classes. Our program has had direct influence on our school's curriculum over more than just the past 5 years. Our efforts have led Oxford schools to implement 3 pre-engineering classes at the middle school and 15 STEM-related courses at the high school. T.O.R.C.'s determination has motivated Oxford schools to build facilities and invest in new curriculum providing more than 1,800 students a year with additional STEM courses. The areas of skilled trades blended with STEM offer students career opportunities that were not

present before.

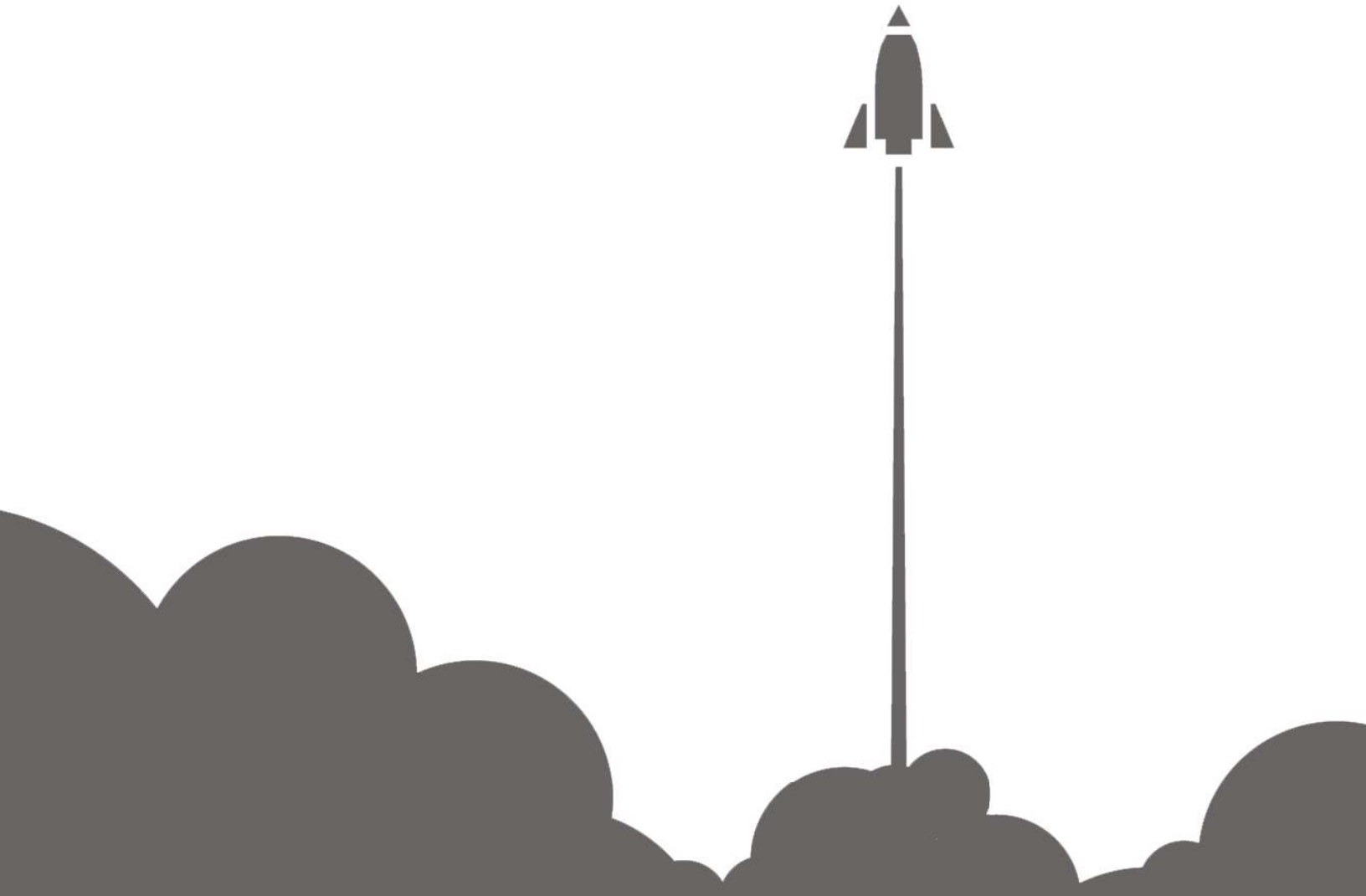
In order to provide increasing levels of ongoing support to our students and communities, we strive to maintain the sustainability of T.O.R.C. We aim to maintain student leadership, mentor guidance, sponsor relationships and our team experience. In T.O.R.C. we are able to sustain leadership throughout the years through the transfer of knowledge from student captains to assistant captains and younger students. Since 2013, T.O.R.C. has developed 82 student leaders. To help our student leaders ensure the progression of growth in our team, we retain the support new and returning mentors give every season. We encourage the involvement of our parents, sponsors, and alumni to volunteer and become future mentors.

We believe it is also important to have good relationships with our sponsors. To show our sponsors how they help us throughout the competition season we host sponsor appreciation events where our students provide a presentation and robot demonstration to show them who and what they're supporting. We believe establishing relationships with new potential sponsors is likewise vital to able to expand our opportunities. This year we were able to form a new partnership with Lightning Technologies. They graciously are providing a space in one of their locations for us to build and house our practice field as well as working to identify other areas to partner with us to support Oxford Robotics FIRST programs.

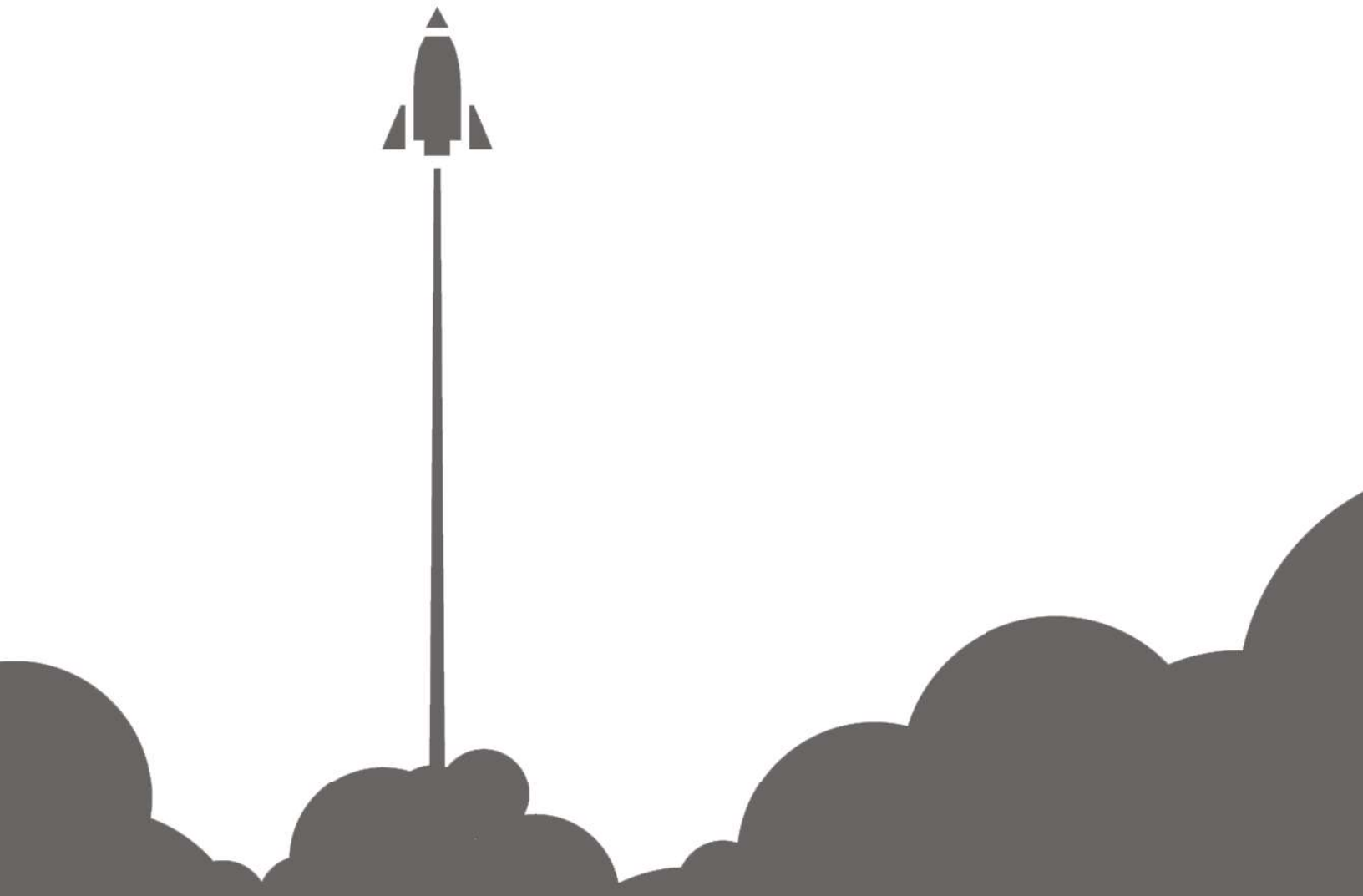
Being able to see and understand how the team functioned in the past allows us to improve upon our methods. Documenting is a crucial part in reflecting upon our previous years. By utilizing our resources and recording vital information about our students, mentors, engineering processes, timelines, and activities to help those around us we can use that information to analyze and take action to further progress as a team.

We believe FIRST does not just change and grow minds, but entire communities when they realize the value of student experiences with our team and the program. T.O.R.C. works with FIRST by offering an intimate connection to the fields of science, technology, engineering, art, and math. We are a team, a family, and most importantly a community. WE BUILD more than robots. We transform the future.

STUDENTS



COMMUNITY



SUSTAINABILITY