

Chairman's Award - Team 4039

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2020 - Team 4039

Team Number

4039

Team Name, Corporate/University Sponsors

ArcelorMittal Dofasco/PythonX/CIMCORP Automation/Magna International/John Deere/General Motors/The Giovinazzo Family/Fabris/Storagevault Canada/Comfort First Heating and Cooling/Caledonia Veterinary Clinic/McMaster-Mohawk W Booth School of Engineering Practice and Technology/Pulse Microsystems/Memme Infrastructure Contractors/Hamilton-Wentworth Catholic District School Board/Loudmouth Golf&St. Mary Catholic Secondary School

Briefly describe the impact of the *FIRST* program on team participants within the last five years.

Opportunities available to team participants and not to others: -skills training in CAD, machining, electrical, programming, and inclusivity. -curriculum Specialist High Skills Major robotics co-op - 10 students x 5 years. -robotics scholarships St. Mary Robotics / McMaster FIRST = \$110,000. -Resources: 3D printer, CNC router, practice field. -Field Trips: MDA, B-Tech & CIMCORP. Outcomes of impact: -100% of grads in post-secondary / 95% in STEM. -Dean's List Finalist 2015/17/Semi-Finalist 2019.

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

-5th anniversary of FLL Qualifier & off-season FRC event -both larger in 2019. -Advocacy = McMaster FRC District(2017), Catholic Board funding for FIRST & practice field. -Workshops -4-H (2019), Cubs/Brownies, Camps(2018) [139 kids]. -Partnership with McMaster Children's Hospital - Go Baby Go & FLL team(2019). -Completion of 3-D printed prosthetic arm(2019). -Supporting First Nations STEM education starting FRC team at Six Nations Polytechnic (2018) & Indigenous STEM conference [244 kids].

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

-Instant of Inspiration- pop up demos reach non-STEM crowds -Good Shephard Christmas Event & STEM Gifts. -STEMley Cup VIP match resulted in FRC district at McMaster. -Authored FIRST Living & Learning article for school admins. -Girls aRe Brilliant STEM role models- videos (15,300 views),a GRB activity book for younger girls & STEM teddybears for Dominican Republic. -Developed robotics curriculum - inspiring an FLL team in after-school program. -CIMCORP sponsor exposure resulted in Finland FLL.

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

-Embracing our motto "live within your means but then work really hard to expand" inspires others they can succeed. -Presentations at Swatposium & 2056 conference. -At STEMley cup, our team didn't compete to support rookie teams - 5921(2015), 6342(2016),7509 &7623(2018),8052(2019) with robot & mentorship. They also learn importance of mentorship. 5406 does this now as well. -FLL Saturdays collective mentorship offered by other teams now. -Mentor won McMaster Alumni Community Impact Award 2016.

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

-Presentations: Board meetings & tours led to school board funding for all teams. -Provide introductions to FIRST & advice -7609(2018) & 8320(2019). -Demos Six Nations Academy & 7623 to attract members(2017). -Shared build space, robots, resources & mentors 6342 -2017 & 7623 - 2019. -Established FRC Practice Regulation Field.-STEMley Cup an opportunity for development & pre-rookie team formation. -Kick off support & grant application assistance. -Provide resources to teams ie business plans.

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

-Board funding started 28 FLL(2019) & 4 JrFLL(2018)&1 FTC(2019) -Team Application completion & Argosy sponsorship completion for FTC 16421 Cathedral Robotics(2019) -Dominican Republic supplying used Lego, NXT, laptop, & training to promote interest -Robotics Workshop at library, Cubs, Brownies,4-H club-Robot demos at St. Bernadette & Canadian Martyrs to attract members -3 Summer camp curriculums (2018) resulted in an FLL team -Mexico education re: FLL & FRC, Spanish FLL booklet resulted in team

Describe the team's initiatives on assisting other FIRST teams (including Jr.FLL, FLL, FTC, & FRC) with progressing through the FIRST program

-Ran FLL Practice Tournament & FLL Saturdays providing teams with feedback -Started & Ran FLL Qualifier (2015/18/19) & provide key roles head ref & judge advisor 16/17. -FLL Coach-the-coach sessions, built practice tables, mentoring -Event Volunteers & trained officials -Boost Award - funds for an FRC team matched by Studica -Off season FRC Event - Chairman's, Rookie & Women in STEM sessions -Collective sponsors - Arcelor & IBM(School Board), MDA(FIRST Canada) -Advocated for practice field

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, & FRC teams)

-Ran FLL Qualifier with team volunteers -Presentations -771 Swatposium & 2056 conferences -Our FLL Saturdays model shared & adopted by others supporting FLL teams -Practice field- work with peer teams to secure funding, get equipment, build practice field -STEMley Cup assisted by 5406- experienced teams paired with pre-rookies sharing robot -Member of Compass Alliance (tag team & help hub) & FIRST Alliance resource to FRC teams -Work together to successfully spread FIRST ie MakerFaire, & CNE

Describe your Corporate/University Sponsors

-ArcelorMittal Dofasco steel producer funds the school board -Hamilton Wentworth Catholic District School Board guaranteed funding/mentors/space to all FIRST teams McMaster University- engineering & associated hospital -provides mentors, hosts FRC district & scholarship program -Innovation Park -startups, business & collective spaces -Lincoln Electric welding, plasma cutting & robotic welding -CIMCORP multinational automation -GM Canada-car manufacturer - John Deere Canada -equipment manufacturer

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

We advocated for multi-team sponsors which appeals to them because they can impact more students, ie: school board (Arcelor,IBM), FIRST Canada (MDA), or practice field (Innovation Park) -CIMCORP -hired mentors, provided co-ops & sponsor Finland's FLL tournament -School Board also able to support SHSM with Arcelor funding -Benefit from mentors (PythonX, Arcelor, CIMCORP) & scholarships (Arcelor, McMaster) -Arcelor Sustainability Series featuring 4039

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

FIRST is about more than robots. Students work with adult professionals on real-world challenges learning engineering principles, problem-solving techniques, business & marketing skills & respecting deadlines & budget constraints. FIRST is unique as it emphasizes collaborative skills like Gracious Professionalism, Co-opertition, & inclusivity, skills our future leaders will need to tackle complex challenges. FIRST kids spread the word that STEM is cool & STEM careers are fun & open to everyone.

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

-We Shift the perception of science & technology. Our rainbow branding is this transformation when exposed to FIRST. Watch us "make the shift". -Our shirts are mentor sewn. -Well-rounded team - Awards in all areas of FIRST -Lead mentor named top alumni of McMaster University - Canada's 150. -Industrial Education Committee real world curriculum. - Advocacy for FIRST inclusion in Canadian Tire Jump Start fund. Thanks for volunteering your time!

For FRC teams older than 5 years, briefly describe your team's broader impact from its inception.

-To date, 4039 started 28 FLL, 1 FTC, & 7 FRC teams (minimum 419 students 2019) -In our board, 7/7 high schools have a robotics team -58% of elementary schools have FLL - 6/7 of our feeder schools -Due to 4039, Hamilton has FLL qualifier, FRC district, Off-season, practice field, 96% of team growth & industrial sponsorship -FLL outreach to Dominican Republic, Mexico & Finland -Focus on Indigenous Support 2018 -1 FRC team -Inspired segment on the Rick Mercer Report about FIRST 1,082,000 views

Team Captain/Student Representative that has double-checked this submission.

Valentina Salazar

Essay

Infinite Recharge - this year's theme speaks to the perseverance, passion & dedication necessary to achieve FIRST's mission of inspiring youth to become science & technology leaders. Leveraging FIRST core values; discovery, innovation, inclusion & impact, our team, MakeShift (FRC Team 4039) works to sustain our achievements & our team. Our initiatives are effective and help us to be a role model. We believe that when we put in effort, it delivers an equal or even greater amount of fulfillment back. This recharges us so we can continue to achieve our goals & be a role model to others.

How does 4039 support FIRST goals?

Discovery

4039's roots are in FLL & our primary focus is on team member development. Discovery allows us to explore new skills & ideas. To support this, MakeShift has secured a robotics co-op in the curriculum leading to a Specialist High Skills Major. Our students inspire our outreach focus. This year, students expressed interest in biomedical careers so we embarked on several initiatives to develop skills & improve our community.

Our team developed a relationship with the Ron Joyce Children's Health Center to collaborate on two initiatives. "Go Baby Go" is a program that provides modified, ride on cars to young children with mobility issues to increase their independence. The team takes cars & adapts them to each child's needs.

Through this collaboration, we reviewed a developed robotics curriculum for children with different abilities with the treatment center staff. We are pursuing supporting an FLL team next year with adapted access and input programming at the Ron Joyce Center.

Our team also initiated a program to create 3-D printed upper extremity prosthetics. e-NABLE's "Build a Hand" program matches individuals who can make a prosthetic with individuals in need across the globe. 4039 has become qualified to create these. Our team gains effective skills & the opportunity to make an immeasurable difference in someone's life.

Innovation

Innovation allows team members to use creativity & perseverance to solve problems. To stand out in a crowd of many impressive FRC teams, MakeShift focused on branding. Our team's name represents the goal of "shifting" the perception of science & technology. This is the basis for our rainbow transformation that represents the inspirational effect of FIRST. This branding has attracted attention that has allowed us to draw attention to FIRST and achieve goals.

Due to rapid growth of FLL, we created an innovative solution to support teams called FLL Saturdays. Teams come to our school to be mentored together. Not only is it efficient for us, it fosters peer learning.

To bring FIRST and STEM to non-STEM audiences, MakeShift developed Instants of Inspiration. Our team has shown up unexpectedly at events like a dinner for Santa or a movie premiere. In 2018, we appeared at the Good Shepherd dinner while families waited for a free meal and time with Santa. We introduced our robot and gave out STEM related gifts.

Our team wanted to support team development and bring rookie teams forward to be successful. FIRST Canada asked us to start an off-season event. We created an innovative format, The STEMley Cup. This off-season event was designed to encourage established teams to provide pre-rookie teams with a robot & a competition experience to give them a good start. We sought out and invited pre-rookie teams. Our mentored teams have an exciting experience to inspire their first season & establish a relationship with us to support them in future.

Inclusion

Encouraging girls' involvement is a priority & girls take on leadership roles on our team. Inspiring girls to pursue STEM careers through strong female role models is the premise of Girls R Brilliant (GRB). Since 2017 our students researched & created YouTube videos about 62 women in STEM. We expanded GRB to include an activity book to make it more engaging. We have initiated an Inclusivity workshop for our team to encourage open conversation about team dynamics.

Outside of our team, we have provided support to indigenous communities. We demonstrated our robot at McMaster Engineering Indigenous STEM camp and encouraged FLL. We also approached the Six Nations Polytechnic and introduced them to FIRST. With our mentorship, this school had a successful rookie FRC team 6509 in 2019. We worked with their mentors to develop a robotics curriculum to be taught at their school integrating Indigenous teachings.

Impact

Our team routinely participates in community events and social media. Through large events like the Santa Claus parade and Ancaster Fair, we introduce FIRST and stimulate interest. In the last 5 years, we have shared FIRST with more than 1 million people and 780,000 social media impressions. You might say that these are just numbers, but our outreach results in FIRST growth.

MakeShift has hosted many small-scale, one-on-one workshops, such as those at the library, 4 H STEM camp, and Brownies/Cubs STEM badge sessions that teach STEM skills. For example, 4039 created a Robotics curriculum for Camp Waterdown in 2018. We introduced this robotics exposure to two other day camps as well. This initiative was so successful that it culminated in an FLL team in their after school program.

Our team never forgets our humble beginnings & our gratitude to teams that helped us. This inspired our Boost Award. Annually we identify a young team with potential & donate a boost of funding to inspire them. Our team has assisted or mentored all board teams in a variety of ways. We have shared our build space, resources & mentors with 6342 in 2017, 7623 & 7509 in 2019. This year in concert with the initiation of FTC in Ontario, we mentored team 16421.

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Internationally, 9 team members travelled to the Dominican Republic with our school's DREAMS project. Over 7 years, they provided LEGO, NXTs, laptops & training to schools in an impoverished area. In 2018, we included solar powered lights and a Spanish colouring book that showed them how to build the lights. GRB was translated into Spanish & accompanied our team members in 2019.

DREAMS inspired a team member from Mexico to bring his FIRST experience to the community where he grew up. He presented to the Polytechnic Institute -School of Mechanical and Electrical Engineering about FIRST & how they could support teams in the area. He introduced FLL to his school in 2018, provided technology & they started a team in 2019. Are these initiatives effective?

4039 has improved the learning experiences of students at St. Mary. 100% of team graduates have pursued post-secondary training -95% in STEM-related fields. Our advocacy resulted in school board funding & support of all FIRST programs. MakeShift started 5 FRC teams in our board & this year we started an FTC team including submitting a center city grant request to enhance their funding. Now every secondary school in our board has a robotics team.& we have 28 FLL teams. Outside of our board, 4039 inspiration helped start FRC team7509 & FLL team 39172 and a new team in Mexico.

4039 also secured resources for teams. A practice field hosted in a retired school opened in 2015. It supports board teams with build space. The facility has CAD access, machinery, & a regulation field which is open to all teams in the area.

Our team's energy started & sustains multiple FIRST events. In 2015, we started & continue an official FLL qualifier that is expanded to 24 teams this year. Teaching our sponsor CIMCORP about FIRST resulted in their sponsorship of a qualifier in Finland. We started & continue to host an FRC off-season event - the STEMley Cup Championship which expanded to a 2 day event this year. Attending STEMley inspired McMaster University Engineering Dean to host a district FRC event & provide \$90,000 in FIRST scholarships. Due to these successes, FIRST Canada selected us to host an FTC event in 2020.

How is 4039 a Role Model to Others?

A role model demonstrates how to succeed, to overcome barriers & be inspiring to others. From a robot performance perspective, 4039 has advanced to at least the quarter finals at the Championship for the last 7 years. We build simple robots that can be built by all teams regardless of resources. 4039 has partnered with other teams to spread FIRST providing workshops at both SWATposium (771) and 2056 Ways to Inspire (2056) conferences. We post all of our resources & are a member of both the FIRST Alliance and the Compass Alliance.

To overcome barriers, 4039's collective sponsorship is a unique approach. ArcelorMittal, a major employer & steel producer in Hamilton, sponsors our school board allowing them to support robotics regardless of government funding due, in part, to MakeShift advocacy. In 2018, 4039 engaged in the Industrial Education Committee to assist in expanding this model & they are now supported by IBM. 4039 has also inspired MDA to support FIRST Canada.

4039's inspiration of others is evident through the exponential growth of FIRST in our community & internationally. What better evidence that we are a role model than for teams to follow our lead. Team 5406 followed our lead at the STEMley Cup not playing so their team could assist other teams to have a good event. Team 4618 has developed a DREAMS program sending Lego resources. Team 7632 is offering an FLL Saturday. These inspiration help to support FIRST growth.

MakeShift works hard to achieve FIRST's mission of inspiring youth to become science & technology leaders. Looking at these outcomes, our student success, curriculum enhancements, growth in our community & internationally, and sustaining these achievements supports our effectiveness as a role model. Our team definitely gets more fulfillment than we give with all of our initiatives. This ensures we are Infinitely Recharged to have the perseverance, passion & dedication to continue to inspire others.