

***FIRST* Impact Award - Team 4039**

2024 - Team 4039
Team Number
4039
Team Nickname
MakeShift Robotics
Team Location
Hamilton, ON - Canada
Describe the impact of the <i>FIRST</i> program on team participants within the last 3 years. This can include but is not limited to percentages of those graduating high school, attending college, in STEM careers, and in <i>FIRST</i> programs as mentors/sponsors.
100% of graduates pursue post-secondary education, 47 of 51 in STEAM fields 10 Specialist High Skills Major with a Robotics Co-op students 3 graduates offered McMaster FIRST scholarships, 1 won the Women in STEM scholarship Last 5 years, 8 students received St. Mary Robotics scholarships 12 graduates mentor our team & 3 other teams 1 grad started 3 Windsor teams 13 members volunteer at official FIRST events-referees, judges, volunteer coordinator
Describe your community along with how your team addresses its unique opportunities and circumstances.
Hamilton is a steel city of amalgamated smaller towns transitioning to tech & manufacturing. MakeShift was the 2nd FRC team in town advocating in our board for financial support for any FIRST team which inspired many more teams. We adopted a collective sponsorship model to support teams in our board (AMD) & FIRST Canada (MDA). Our school has declining enrollment but our Robotics team attracts students. We are close to McMaster University benefitting from mentors and resources from them.
Describe the team's methods, with emphasis on the past 3 years, for spreading the FIRST message in ways that are effective, scalable, sustainable, and creative. How does your team measure results?
Effective: STEMley provides a practice event. Post pandemic, 11 teams who did not compete in 2021 were helped to restart. Scalable: Elementary school tours at provincials engaged 417 students in 2023 & spreading to other schools & teams. Sustainable: Instants of Inspiration, a simple pop-up robot demo = 6610 people reached. Creative: Our Robot Featured in Lifetime Movie - "The Price of Fitting In." 203,000 views. Results: 3 years of Robotics workshops at Ron Joyce resulted in their FLL team.
Please provide specific examples of how your team members act as role models within the FIRST community with emphasis on the past 3 years.
MakeShift's motto "live within your means" helped us manage through COVID. In 2021 we shared our adapted plans for safe meetings & outreach at the Gateway Conference. Our build-a-bumper squad helps teams at events get on the field & teams seek us out at events for help. At STEMley, rookies don't

pay & use our robot to learn about FRC. Our Anybot program provides FTC rookies with a start- used by 7 teams in 2021. We educated teams about Neurodivergent of FIRST to support these participants

Describe your team's initiatives to Assist, Mentor, and/or Start other *FIRST* teams with emphasis on activities within the past 3 years.

Started: FRC9098 through inspiration from 4039 parent. Started 7509 by visiting their school, sharing workspace, & ongoing support. Registration funding for board FLL & FRC teams started all board teams. Assisted: Hamilton Shared Practice Field used by dozens of teams from Kingston to Niagara. Host an FLL Practice Tournament. Our Boost Award gives a percentage of team revenues to an FRC team with potential. Mentored: FLL Teams 54588, 63478, 41337, 55748, 62866 (2023), FRC 9098 (2022), 9621(2023)

Beyond starting teams, what initiatives have you done to help inspire young people to be science and technology leaders and innovators? What results have you seen from your efforts in the past 3 years?

Sidewalk Science- children find a science topic written on a park sidewalk & chalk to write down their questions & answers appear later, resulted in 38,867 social media impressions STEM workshops: T-Bot Build Workshop in 2023 for gifted students in our school board. Ron Joyce specialized camps (2020,21,22,23) earning positive feedback "Inspiring!" FLL mentoring & Practice Tournament - 6/8 teams that we supported advanced to provincials.

Describe the partnerships you've created with other organizations (teams, sponsors, educational institutions, philanthropic entities, etc.) and what you have accomplished together with emphasis on the past 3 years

Makeshift arranged with our school board to have students come to the event as a field trip. This success has inspired FIRST Canada to continue this initiative with our support 417 of students. St. Joseph's Healthcare infection control & sterile processing resulted in 858 3-D printed face shields for hospitals, nursing homes etc. We work with other teams & boards to offer events – STEMley Cup(40 teams helped to restart), FLL Qualifier & practice field supporting teams from Kingston to Niagara.

Describe your team's efforts in the past 3 years to promote equity, diversity, and inclusion within your team, *FIRST*, and your communities.

We are the first Canadian team to be a member of Neurodiversion in FIRST. Ensuring accommodation for people with different abilities. We created an Inclusivity session based on our rainbow theme "every colour brings something to the team" We allow students to join our team who do not go to our school Students research female STEM role models & create videos to inspire for the Girls aRe Brilliant campaign. STEMATHON participation to empower girls Mentored Lesotho FIRST Global team (2021)

Explain how you ensure your team and the initiatives you have created will continue to run effectively for the foreseeable future

4039 knows we can only achieve goals through relationships. Our strong support in our school board ensured FIRST teams retained funding. Collaborating with our peer teams & FIRST Canada allow us to offer events ensuring ongoing volunteers. Our proximity to McMaster aligns us with them for mentors, resources. In addition, our motto of doing the best with what we have & our business model ensures we have finances to navigate difficult times. Every team member must seek sponsorship & alliances.

Describe your team's innovative strategies to recruit, retain, and engage your sponsors within the past 3 years

We suggest collective sponsorship ie sponsor our school board or a shared event We create events to strengthen relationships. ie: a mentor set up a challenge between MDA engineers & FLL teams. Knowing our sponsors ie: our John Deer mentor enjoys events so we give her interesting volunteer roles. Recognizing the current economy suggesting support in products, expertise. Our work extends our sponsors' corporate responsibility ie a team member profiled in ArcelorMittal Dofasco's charitable report.

Highlight one area in which your team needs to improve and describe the steps actively being taken to make those improvements.

We wanted to improve student experiences. A quality review determining our onboarding needed to be more hands on. We created student-led pods called CANS (Creating Awesome Now), which connect rookies while developing leadership skills in senior students. Onboarding interviews were started to determine student goals that mentors keep top of mind throughout the season. 100% of students this year responded they strongly agreed to a survey question that they felt they had been welcomed onto the team.

Describe your team's goals to fulfill the mission of *FIRST* and the progress you have made towards those goals.

Our goal is to inspire growth. FLL school board teams increased to 16 teams. Recent initiatives beyond our borders include: mentoring a FIRST Global team in Lesotho & advocated for a Ugandan team to attend an Ontario event. Growth in under-representative populations. The vision of an FLL team at Ron Joyce Treatment Centre for children with different abilities started with our workshops & was realized in 2023. Efforts to support female growth resulted in mentors up 0 - 5 & students up to 32%.

Briefly describe other matters of interest to the *FIRST* Judges, including items that may not fit into the above topics. The judges are interested in learning about aspects of your team that may be unique or particularly noteworthy.

-Inspired segment on Rick Mercer Report about FIRST 1,082,000 viewers -A team member educated his elementary school in Mexico starting an FLL team & our sponsor CIMCORP sponsored an FLL tournament in Finland 2016. -We Shift the perception of science & technology. Our rainbow branding is this transformation when exposed to FIRST -Well-rounded team - Awards in all areas -3 team members won the FLL coach award 2021 -Our shirts are mentor sewn Thanks for volunteering!

Judge Feedback

Who/When

Feedback

Apr 06,
2024
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Is there anything that the judges feel we didn't fully explain, or give enough detail on, that they'd like to know more about?

An area the team has an opportunity to improve.

Something that really impressed the judges.

Essay

Margaret Mead once said, "Never doubt that a small group of thoughtful, committed, citizens can change the world. Indeed, it is the only thing that ever has." At MakeShift Robotics (4039), our small team makes an astounding impact towards FIRST's mission of inspiring young people to be science & technology leaders to solve the world's problems. Our team calls this "Making the Shift", altering the perception of science & technology in our school, community, & the world. How can a small team change the world? Through partnerships, people, progress, & passion. PARTNERSHIPS As a small team from a small school, we have found ways to boost our impact through partnerships. As the first FRC team in our school board, we worked for years towards the goal of providing the opportunity for every child to be inspired by being on a FIRST team. Our tireless advocacy convinced them & led to a focus on STEM & FIRST that has blossomed into a thriving robotics ecosystem. Fast forward to the present & every school in our board that wants to run any FIRST team is guaranteed funding. This partnership is held up by FIRST Canada's FRC Program Manager as "the foremost school board in the entire province - the qualities they are generating through the education piece are nothing short of spectacular". Our efforts have been rewarded by exponential team growth. Interrupted by the pandemic, we're building back & now have 16 FLL, 2 FTC, & 3 FRC teams. It also enabled us to provide other opportunities to students like our T-bot build & mini competition at Provincials in 2023 with the Board's gifted program. Our partnership has enabled new opportunities for teams to compete as well. We have hosted & run the Hamilton FLL Qualifier since 2015. We founded a dedicated robotics practice field in Hamilton - a home for Board FRC teams who do not have space to work at their schools. This field is open to all teams & has hosted over 24 teams from across Ontario in the last 3 years. 4039 has hosted the STEMley Cup Championship since 2015. The event proved so popular that we added Overtime Sunday & in the last 2 years alone, this event has allowed more than 100 teams to prepare for the season at a friendly, world-class competition. Recognizing the commitment of our small army of volunteers, FIRST sought our assistance to host qualifiers in 2021 when McMaster University couldn't host. At the 2023 FRC Provincial Championships, 4039 seized the opportunity to organize innovative field trip visits for elementary school children. Partnering with FIRST Canada, we exceeded the goal of this pilot & over 400 students had the chance to learn about FIRST through pit tours, STEM-Bingo, & curriculum-tied follow-up activities. We're building on this success at the 2024 Provincials by partnering with 7 other teams to provide field trips to even more children. Through these strategic alliances, our small team has amplified our impact, empowering growth, innovation, & community engagement. PEOPLE – GROWING TOGETHER To foster collaboration, our team actively shares knowledge & builds strong bonds to propel future projects. Throughout our history, 4039 has been dedicated to mentoring, assisting, & supporting other FIRST teams across all levels. For the FLL program, we focus on building the numbers & capacity of team members by annually mentoring teams. Despite the challenges posed by the pandemic, our students doubled their efforts, mentoring 2 teams each year in 2021 & 2022. Recognizing students had only competed remotely, we offered a practice tournament in 2022 to provide teams with a valuable in-person experience. This year, our commitment expanded as our team members supported 6 elementary school teams. Every year MakeShift assists & mentors FRC teams as well. The STEMley Cup is often the first step in mentoring new teams; we invite pre-rookie teams to attend for free, lend them our robot & mentor them extensively. This creates a supportive connection & allows our team members to develop mentoring skills. Over the past 7 years, we've supported 8 pre-rookie teams. Most recently, we started 9098 in 2022 & mentored them to one of the most successful rookie seasons in FRC history. This year, 9621 is receiving this successful formula: full STEMley opportunity, training, hosting their kick-off, & in-person support at each of their events. Internationally, over 7 years, 9 team members have traveled to the Dominican Republic with our school's DREAMS project, providing Lego, NXTs, laptops, & training to a local school. This led one of our students to introduce FIRST to his former school in Mexico, starting an FLL team there in 2019. In 2021, we mentored a FIRST Global Innovation Challenge team in Lesotho,

Africa. Notably, Lesotho now boasts the first FRC team in Africa, a testament to the international reach & impact of 4039. **PROGRESS THROUGH INNOVATION** A small team needs to be creative to have an impact. We created *Instances of Inspiration* where our robot shows up where you least expect it. This approach captures the attention of non-traditional STEM audiences like in 2018, showing up at the Christmas Good Shepherd dinner & in 2023 at the Cirque du Soleil pre-show. While families waited for Santa or the Circus, our students hand out STEM-themed gifts while our robot whizzes around. Our off-season recycling-promoting robot CRuSH gets attention everywhere she goes. This innovative robot was born from a team priority to impact the environmental crisis. Annually, approximately 36 billion aluminum cans were landfilled. Recycled aluminum uses less than 5 percent of the energy used to make the original product. Recycling one can save enough energy to run a 60 watt incandescent bulb for 20 hours, or a computer for 3 hours. 4039 collaborated with the world's largest aluminum can supplier Novelis to create CRuSH, our can-crushing, that encourages young people to recycle cans. Our team even melted down the cans to cast the STEMley Cup trophies this year. In 2020 to continue outreach with restrictions, 4039 facilitated Sidewalk Science. We invited kids to write questions about a science topic (Dinosaurs, the solar system, etc) in chalk on the sidewalk in local parks. Our students then respond with answers using chalk. This was such a success that we are continuing Sidewalk Science every summer & now bring CRuSH to the park too! Innovative ideas extend our mentoring reach. Having heard about our support for Team Lesotho in the 2021, the African School of Innovations Science & Technology contacted us to compete at the 2023 STEMley Cup. We wrote letters of invitation to the embassy to support their VISA application. While the Ugandans were not able to secure travel visas in time, they are intending to come to STEMley 2024. To mentor them long distance, we created an innovative plan for the Ugandans to compete in the 2025 event in Ontario District. This plan includes building identical "kit of parts" robots in Uganda & Canada. This will allow the Ugandans to get the robot build experience without having to transport it here. We look forward to hosting their team & working side by side with them at a 2025 event to ensure the first FRC team in Uganda gets a successful start! **PASSION** Meaningful impact requires dedication. Projects that are driven by a student's passion get results. When our students expressed interest in biomedical engineering, our team worked with St. Joseph's Healthcare to develop & deliver 855 face shields to hospitals & nursing homes. As a certified designer and builder for eNable's Build a Hand program matching those who can make a 3D printed upper extremity prosthetic with those in need, 4039 has provided custom prostheses to enhance 2 individuals' lives. Inclusion is key to MakeShift's mission bringing STEM to under-represented people. In 2019, we approached the Six Nations Polytechnic & started FRC team 7509 there. We inspired this indigenous community & have a strong relationship with them following their lead to support their initiatives. Our students wanted to encourage girls to pursue STEM careers. Hearing the stories of strong female role models is the premise of our Girls R Brilliant initiative. Since 2017, our students have researched & created videos that showcase the achievements of 78 women in STEM. At STEMley we host a Women in STEM session. Team members feel strongly about ensuring accessible robotics programs. We collaborated with the Ron Joyce Children's Treatment Centre to deliver 2 remote robotics programs for children with different abilities in 2020/21. We assisted FIRST Canada in delivering an in-person program in 2022. We are the first Canadian team to partner with Neurodivergent of FIRST(NDoF). NDoF represents neurodivergent individuals promoting education & their acceptance in the FIRST community. We educate teams about the Association at STEMley & all our District events. 4039 provides enhancements to the quiet room at our events including soothing lighting & activities to support those needing a calming space.

OUTCOMES: Beyond what we have already outlined, has our small team changed the world? In 11 years, we have reached 10,204,672 people educating them about STEM & FIRST. Our partners at McMaster University were inspired by our passion to offer FIRST scholarships of over \$90,000. Our Ron Joyce workshops evolved into an FLL team made up of under-represented youth who advanced to the

Provincial Championships this year. Our initiatives have reached the Dominican Republic, Mexico, & Africa inspiring a school in Uganda, to reach out for our support & to consider flying across an ocean to compete in Ontario. 100% of our graduates pursue post-secondary education, 94% in STEM fields. 4039 graduates return to mentor teams, volunteer at events, & organize FIRST events. "Never doubt that a small group of thoughtful, committed, citizens can change the world." Imagine what the world would be like if every FIRST team made this kind of impact? ;

