



**THEORY**  
**6**

**Judge's Package 2019**

**TEAM**

**1241**





# FIRST BADGE PROGRAM

## MISSION STATEMENT

The Badge Program was created to recognize FIRST participants individual growth and achievement. We're building a desire within FIRST participants to continue to progress through the programs, knowing the skills they've attained will carry-out in the rest of their life. This program is providing tangible evidence of participants' dedication, which can then be recognized as proof of knowledge in post-secondary workplace pursuits.

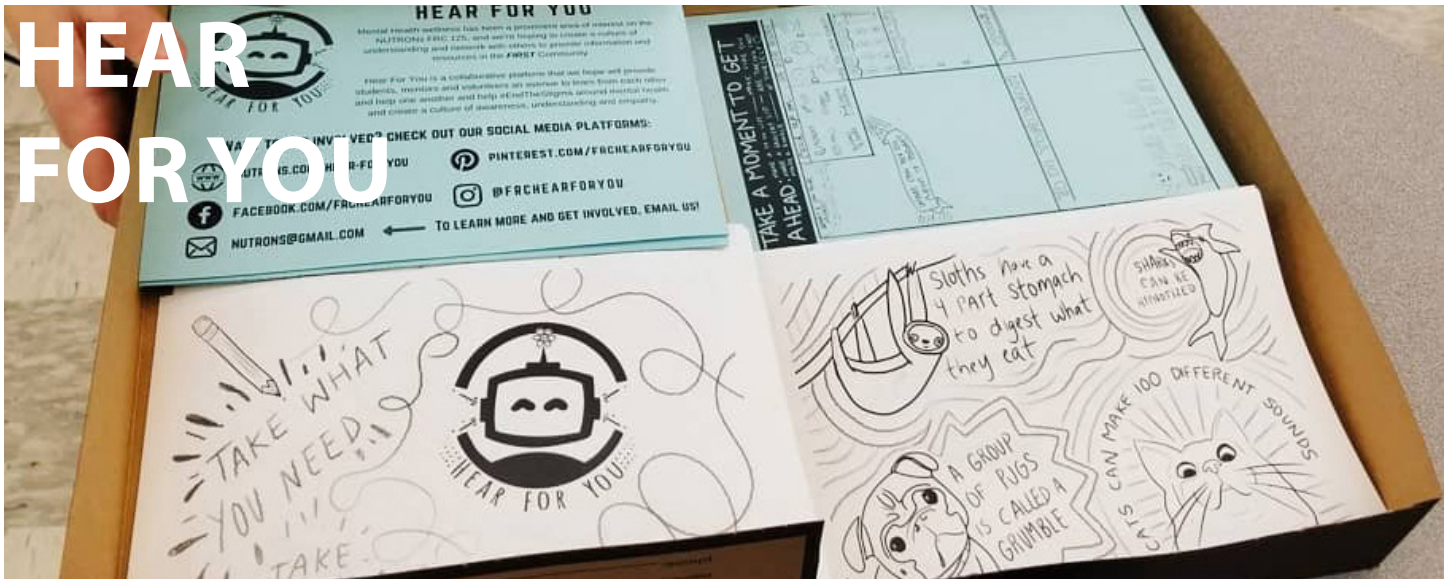
## OUR IMPACT

In early 2014, we created FIRST Participation Badges for all student participants and proposed the idea of a Badge series to FIRST Canada. This initiated our partnership and led to the rollout of the badges. It also led to the creation of FIRST LEGO League Jr. and FIRST LEGO League badges, so that team members may obtain badges as per the number of years they have been part of FIRST. These are categorized into 3 levels (Bronze, Silver, and Gold). John Abele presented our Badge Program to the FIRST Board of Directors at the 2014 World Championship, which provided the Badge Program international visibility. The Badges were made available at the FIRST LEGO League Ontario Provincial East and West Provincials, enabling over 800 students to obtain badges in 2015. In 2016, the program grew to all Ontario Regional and Provincial tournaments, which impacted over 4000 students.

Due to increased interest and demand for badges, we worked with FIRST Canada to roll out the first skills badge for the FIRST Robotics Competition, the Safety Badge. At each of the 2016 FRC Ontario Regionals, over 100 badges were distributed to Safety Captains. In 2017 FIRST Canada released the Safety & Mentor Badges across Canada to all FIRST Teams in both French and English to meet Canada's bilingual requirements, and to encourage more people to make safety a priority. Students can earn Safety Badges by completing an online test found on the FIRST Canada website, which this season alone has been completed by 2000+ participants. FIRST Canada saw the potential in our program and since adopting it, over 15,000 students have earned badges, and continue to work towards new achievements.

## FUTURE PLANS

Through our work with FIRST Canada, we have seen this program extend to thousands of students. Our aim is that the badges expand to other areas of FRC, including Design, Mechanical, Programming, Electrical, Business. There is also a large potential for the Badge Program to grow to U.S states and other countries that support FIRST.



## MISSION STATEMENT

Hear For You is an international movement that is starting a conversation about mental health in the FIRST community and creating inclusive spaces at competitions. As a division of The Compass Alliance, teams are contributing to this important initiative and elevating the platform to reach every single robotics team, with the goal to make mental health as important in FIRST as competition safety is.

## OUR IMPACT

In 2018, FRC Team 125 introduced Hear For You to The Compass Alliance, along with the idea of the Quiet Room. A Quiet Room is simply a space at FRC competitions where participants can de-stress and regroup, away from the commotion at competitions. In the room you can find things such as colouring pages, stress balls and puzzles, creating a relaxed environment. During the 2018 season, 12 Quiet Rooms were held at 2 regionals and 10 district events, spanning 2 countries.

FIRST HQ approached The Compass Alliance to build a partnership, hoping to join in our effort to bring Quiet Rooms to as many competitions as possible. Through this new partnership, we've published event guides on FIRST's website that outline the process of setting up a Quiet Room, along with all the resources required from event coordinators. FIRST has highly encouraged all events to incorporate a Quiet Room and we have seen an extremely positive response from the FIRST community.

Team 1241 has been heading Hear For You's social media influence, creating posts for the community that outline the common concerns students and mentors face throughout the season. Our "Wellness Wednesdays" are weekly posts educating the community on important topics such as managing your work and time, getting enough sleep and eating properly, especially during build season. We reinforce these ideas by giving the audience "Self-Care Challenges", with challenges such as creating a work schedule, sleeping for 8+ hours and getting 30 minutes of exercise.

## FUTURE PLANS

The Compass Alliance and FIRST HQ have given us the platform to create significant change in the global FIRST community. As we continue this movement, one of our goals is for Quiet Rooms to become standard at every competition in every country with a FIRST program. We are hoping to start a FIRST-wide campaign of testimonials and video footage about how the Hear For You program has supported participants and created a positive culture at competitions.

1241 also hopes to continue our impact within our own school and community, hosting events and campaigns that raise awareness regarding mental health. We will continue to create accessible, inclusive and safe environments for all FIRST participants and work to end the stigma surrounding mental health.





# LIBRARY PROGRAM

## MISSION STATEMENT

Team 1241: THEORY6 has been transforming libraries into multi-dimensional learning spaces for the past 8 years. The workshops we host at the library provide opportunities for youth to experience hands-on learning through FIRST and LEGO robotics. Through this program, we have made STEM education free and accessible in a collaborative environment, creating a community fueled by a passion to pursue STEM. We've created an evolutionary cycle that helps youth progress through different levels of STEM learning, starting from our library workshops to then advance to FIRST programs.

## OUR IMPACT

In 2011, we collaborated with Mississauga's Central Library to provide curriculum-based year-round free robotics workshops, available to children ages 5-12. The workshop curriculum is catered towards building upon knowledge at every session, starting off with simple machines and ending with a successfully coded and functional robot. By using LEGO WeDO and EV3 kits, we are preparing students with the knowledge to help them progress through our evolutionary cycle and excel on an FLL jr. or FLL team. The students are also building important life traits such as collaboration, time management, presentation and interpersonal skills. FIRST Canada recognized the impact we were making in our local library and partnered with us to publish the library curriculum on their website, creating a path for the program in all of Canada.

Since its inception, the Library program has grown to 12 libraries across Ontario impacting over 2300 youth, instilling a desire to explore STEM within the youth attending. These efforts are allowing for the creation of more FLL and FLL jr. teams in schools and libraries. Through the Library Program, we have started 21 FIRST LEGO League and 6 FIRST LEGO League Jr. teams in the past 5 years from just one library. By offering these learning opportunities, members of our team contribute to our evolutionary cycle through mentorship of younger students, using experience and knowledge they attained through our team and FIRST. Once they graduate from high school, our alumni are dedicated to continuing on by guiding and sharing their expertise with team members and younger students. While giving back to the community through mentoring, we are able to grow STEM culture by creating and inspiring the leaders of tomorrow.

## FUTURE PLANS

Our team aims to inspire other FIRST teams to integrate robotics workshops into their libraries and public community spaces. By working with teams from the U.S., we plan to spread it to those libraries and influence more youth to pursue STEM. We will also be looking into establishing this program in community centres and in provinces outside of Ontario, such as British Columbia and Quebec. To expand our reach, we are working to translate our curriculum into multiple languages to broaden our reach, with the aim to start sustainable learning programs in as many provinces as possible.



## MISSION STATEMENT

Team 1241 is constantly looking to cultivate a culture where we inspire new minds, build STEM consciousness and generate awareness of FIRST programs. Through our various initiatives, including translated FIRST guides and robotics workshops, we aim to engage newcomer youth in our community with STEM.

## OUR IMPACT

Following the rise in Canadian immigration rates in 2016, we recognized the obstacles newcomers faced in their everyday lives. To proactively support these newcomer families, we worked with school clubs to raise over \$30,000 to sponsor a Syrian refugee family's immigration to our community. In the past, we also implemented our Peer-to-Peer volunteering program, where newcomer students were paired with our team members, who they shadowed for outreach events. In 2017, we brought 100 families to the Ontario District Championship, aiming to engage NTC youth as early as we can and spark an interest in FIRST. To further help newcomer families understand robotics and the structure of our team, we have translated our parent handbooks into 5 languages (English, Arabic, Spanish, Hindi and Mandarin) to help newcomers understand FIRST Robotics programs and their options for getting involved.

With our partners Pratt & Whitney Canada, United Way, and their partner agency Polycultural, we grew our NTC program exponentially, enabling us to initiate our Polycultural workshops. What started as a one-day workshop at the Comfort Inn then led to us doing a series of workshop in one of Polycultural's centres. We recruited 4 FRC teams across Ontario (1285, 4939, 6070, 6378) to help us host multiple day-long, week-long and 20-week-long workshops over the year. With visual-based content to accommodate for language barriers, the workshop curriculum taught simple mechanical and programming concepts, aiming to spark curiosity. We saw the growth of students as they were hoping to join FLL jr. and FLL programs after their experience in our workshops.

## FUTURE PLANS

In the future, we plan on having this information available for new immigrants by implementing this initiative in ports where newcomers visit frequently, such as immigration offices, embassies, airports, libraries, community centers, and even Service Ontario. We also aim to expand our Polycultural workshops by introducing them to more of their immigration centres across Ontario. By partnering with the Peel Welcome Centre, our local help centre for immigrants, we hope to influence and encourage newcomers to get involved in STEM and help them integrate into their community.





# FIRST CANADA SUPERHUB

## MISSION STATEMENT

As the first of 3 official FIRST Super Hubs in Canada, Team 1241 provides any FIRST team in our region with access to resources, facilities, and mentor support. We are creating a platform all teams can access, regardless of location or experience, to help them achieve their goals as a team. These efforts are bridging the resource gap within FIRST, guiding teams to reach their highest potential and levelling the playing field in Ontario.

## OUR IMPACT

Our team offers support to all teams in technical and administrative areas of FRC. By sharing documentation in the form of our business and robot playbooks, which have amassed over 15 000 downloads, teams access our refined practices and use them as a guide through the season. Throughout the build and competition seasons, teams are also welcome to contact us or drop in for one-on-one mentorship in all forms.

To build more opportunities in schools, we formed FRC Teams 4946, 4939, and 1285 in 2014. In 2017, these 3 teams that have been working alongside us for years, won the Durham District Event together. We have seen them grow into sustainable, self-sufficient teams. In fact, FRC 4939 won all three of their district events that year. Last year, we mentored an all-girls team from Afghanistan. With the use of our playbook guides, our build space, and six of our mentors, they shattered all expectations when they built a robot in 3 weeks and won the Rookie Inspiration award at the World Championship. We have also facilitated teams from North Bay, Mexico, and billeted a team from Singapore so they would be able to compete in Ontario. In the same vein, we have been consistently sharing our facility with 7 other FRC teams for the past 3 years.

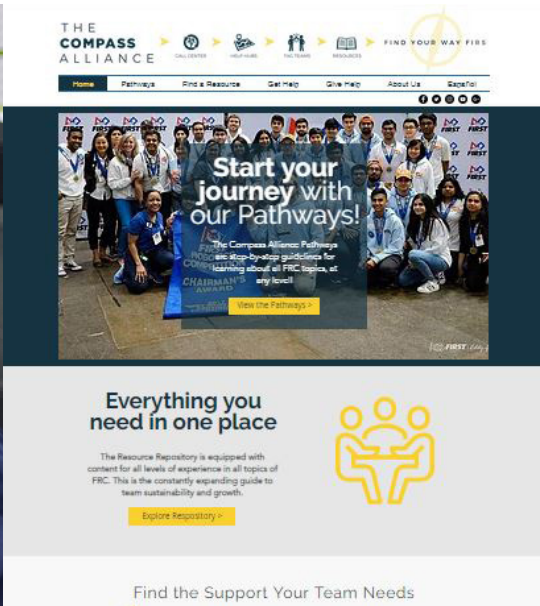
In 2018, FIRST Canada invited us to attend the Canadian Pacific Regional in British Columbia to support and inspire rookie FRC Teams by showcasing Ontario's level of competition. In the past, our team has also regularly participated in Quick Build Canada, where we support rookies in building drive trains on Kick-Off.

During competitions, our "A-Team", a designated group of students and mentors, dedicate their time to supporting rookie and veteran teams. Last season, we assisted 110 teams at competitions. Through our A-Team and Super Hub, we have assisted 70 teams in our country alone.

More recently, we elevated the Canadian Super Hub program to an international platform, as Help Hubs. To promote sustainability and collaboration within FIRST, we reached out to international teams to run Help Hub resource centres taken after our Super Hub model in their regions. As of 2019, 43 teams across 7 countries have become Help Hubs. This past year, we partnered with FIRST HQ to identify and create integral resources, such as an introduction to Sponsor Relations and Scouting, sent to every FRC team and available on the FIRST website.

## FUTURE PLANS

We are currently looking to expand our Super Hub program by creating and sharing more structural documents and translating existing ones into different languages. We want to give teams all over the world access to our process documentation without any barriers. By uploading team documents online, we increase our internet presence and support teams who may not have the same resources and opportunities as we do, effectively taking steps to close the resource gap between FIRST teams.



## MISSION STATEMENT

The Compass Alliance (TCA) is a consortium of teams around the world working to create a global impact on the FRC community and sustain the FIRST ecosystem. The Alliance's goal is to be a one-stop shop for all things FIRST, comprised of best practices, tips and tricks from veteran teams. The passion teams have for helping others get the most out of their FIRST experience and bridging the resource gap is being ignited through The Compass Alliance.

## OUR IMPACT

In 2017, Team 1241: THEORY6, alongside 9 other FRC teams, became a founding member of The Compass Alliance (TCA). This partnership has branched out into 5 major divisions: FIRST Call Center, FIRST Help Hubs, FIRST Tag Teams, The Compass Alliance Resource Repository and Hear For You.

Further enhancing our collaborative initiatives, TCA recruits FRC teams that have shown proven success to contribute to our programs as our Alliance Partners. We are one of the 15 contributors to the online 24/7 FIRST Call Center, a service that provides visitors with immediate responses to their questions during build season from veteran teams.

The partnership we've built with FIRST Canada exemplifies the effectiveness of our Super Hub program, which encouraged us to bring it to TCA, inspiring the international FIRST Help Hubs program. Team 1241's experience with the practical and logistical aspects of supporting other teams has built the template for Help Hubs teams to follow. As of the 2019 season, 43 FRC teams have set up Help Hubs in their facilities, making administrative support, machine shops, 3D printing and other direct mentorship assistance accessible to teams in 7 countries.

In 2019, TCA was approached by FIRST Headquarters to establish a partnership, allowing for our resources to be sent out to and accessed by FIRST teams around the world. We've also shared our expertise and resources through the other branches of TCA - the resource repository and our mental health initiative, Hear For You (see Hear For You info). Mentors and students on our team have published resources on scouting, sponsor relations and promoting a positive team culture, all of which are accessible through FIRST's official website and TCA's resource repository.

## FUTURE PLANS

The Compass Alliance continues to create sustainable practices that bridge the resource gap in FIRST and elevate teams to reach their highest potential. Our new partnership with FIRST HQ is providing us with an even bigger platform to make a larger impact. We aim to leverage this partnership to make resources available in more languages (Spanish, French, Hebrew) and curate content into more specific facets of robotics. In the coming years, we will continue to recruit more teams to join us in our international effort, promoting Coopertition and sportsmanship in FIRST.





# GIRLS IN STEM

## MISSION STATEMENT

We are advocating for gender equity to create a future where everyone is provided with an equal opportunity. On Team 1241: THEORY6, we aim to surround ourselves with an inclusive, encouraging environment where everyone is welcome to pursue their interests. By creating a culture that recognizes that ability is learned and not gender dependent, we are creating a future where the aspirations of females are valued equally to those of males, and we are increasing accessibility to STEM fields with traditionally lower levels of female involvement.

## OUR IMPACT

Rooted in the understanding that our team is predominately male, we founded our Girls in STEM program to tackle gender-based adversity within our own team, our community and in FIRST. Since 2013, our team has been competing as an All-Girls team at an offseason event, in which 100% of competition roles are filled and led by girls. Through this, female students are able to develop their skills in a competitive environment, challenging and pushing themselves out of their comfort zone. We have seen 66 girls continue to pursue their roles during the regular competition season, and have inspired other teams in Ontario to start this tradition as well. Following the motto “If I can see her, I can be her.”, we created Redefining Girls in 2018, a print and social media campaign sharing the stories of females finding success in their passion, and creating positive role models for members of our community and in FIRST.

Partnering with Scotiabank Digital Factory in 2018, we hosted our second annual Girls in STEM Olympics, providing females aged 13-18 within and outside our community with the chance to participate in STEM-based challenges and activities that utilize elements of programming, structural engineering, systems design, and more. We hosted an innovation fair, showcasing work and opportunities from our conference sponsors, including Quanser, Baylis Medical and the University of Toronto, as well as a panel of gender-equity advocates and industry professionals to discuss adversity females face in STEM and in the workplace.

## FUTURE PLANS

Our team aims to inspire other FIRST teams to integrate robotics workshops into their libraries and public community. Our goal is to provide all females with the opportunity to pursue an endless possibility of dreams and to equip them with the skills and ambition to continually find success in those dreams. Our Girls in STEM Olympics event is growing and improving every year, and we plan to fuel this momentum forward in the coming years by bringing our model to more locations around the world through a chapter system. We are also working towards bringing our event to younger audiences through our feeder schools and community-based summer camps.





# BEYOND BORDERS

## MISSION STATEMENT

We are expanding our reach globally by bringing STEM and FIRST to youth beyond our own borders, developing leaders who create a change in their local communities. By promoting enhanced STEM education in as many countries as possible, we are able to create the innovators of tomorrow, offering more opportunities for technological growth. Through the connections and relationships we have built, we are creating sustainable foundations to build upon for future FIRST programs in underserved communities.

## OUR IMPACT

Our Beyond Borders Program has been implemented in countries including Denmark, Singapore, and China. Our principal presented FIRST to a school in Singapore, in us facilitating a Singapore team's expedition to a Canadian regional the following season by billeting their students in our houses. We have held 4 webinars with an ESL class in China, teaching them about basic mechanisms and electrical systems using robots, based off of our developed Library Program curriculum.

In 2017, one of the areas where we saw a higher demand for STEM programs was Africa, which led to us bringing our Beyond Borders program to Zimbabwe. Through weekly Skype workshops, we taught them the FLL concepts team using the LEGO EV3 kits that we sent them and built upon their mechanical and programming skills.

In 2018, a student from our team moved to a new school in Atlanta that did not have any robotics programs. We helped them continue their FIRST journey by supporting them in an endeavour to start an FRC team at their school. Realizing the potential in our work, FIRST Canada invited us to compete at the first Canadian Pacific Regional, where we got the opportunity to share our knowledge with rookie teams and bring the spirit of FIRST Ontario to British Columbia.

## FUTURE PLANS

In the near future, our team is looking to extend our Beyond Borders initiative to countries that have a lack of resources to incorporate FIRST programs. We want to provide financially applicable avenues to help children across the globe gain access to STEM education within their schools, thus paving the way for more individuals' FIRST experiences. As a team, we are conscious of our privilege and are eager to share our passion for STEM and FIRST globally.



### ***Dryage Facilities***

Since 2004, we have been providing teams from all around the world with a space to store their materials, tools and even robots. Since then, we have expanded our support from teams in our city to teams in different continents.

### ***TEDX Conference***

In the summer of 2012, to spread FIRST even further and share our experiences as a team, we went to Toronto and gave a presentation to a community of leaders and changemakers. We shared our passion for robotics and inspired the attendees to use STEM as a tool to create change within their own communities.

### ***CIBC Run For The Cure***

In 2013, our team participated in the CIBC Run For The Cure at the University of Toronto. In addition to the run, we raised over \$1,500 from donations, giving all of the money back to a cause close to our team.

### ***Recess Kids***

In partnership with our city, we worked together to host a citywide event at the biggest tourist spot in Mississauga, the Celebration Square. At this event, we represented FIRST and showcased the vast amount of opportunities available through the multiple programs within FIRST.

### ***FIRST Lego League Jr. Expo***

Since 2013, we have hosted a FIRST LEGO League Jr. Expo. With over 65 teams participating at the very first event itself, in the past 5 years, we have assisted over 190 teams.

### ***City of Mississauga Youth Connect***

In 2014, we showcased ways to build a future in FIRST to the citizens of Mississauga, using our robots to demonstrate where a passion in STEM can take them. These demos exemplified the values of FIRST while inspiring our local leaders of tomorrow.

### ***City of Mississauga Park Cleanup***

Using our team's strong community presence, we wanted to ensure that our city can grow and function under the best circumstances. From 2010 - 2014, our team participated in the City of Mississauga Park Cleanup, which was lead by our city councillor and team advocate, Ron Starr.

### ***FIRST Lego League Qualifier Tournament***

For the last 8 years, we have hosted one of the largest and most successful FIRST LEGO LeagueQualifier tournaments in the province. To engage the newcomer students in our community, we established the Peer to Peer Volunteer program at the tournament. This program helps newcomers gain an interest in STEM and complete their 40 community volunteering hours, with 27% of our volunteers being newcomer youth, of which over 80% were females.

### ***City Hall Presentations***

In order to strengthen our partnership and gain support from our government, we have presented to our city council every year since 2011. This allowed us to shift culture and expand our movement in bringing STEM to everyone.

### ***Syrian Family Fundraiser***

We believe collaborative work always results in the best possible solution. Which is why we worked with other clubs within our school and raised over \$30,000 to sponsor a Syrian refugee family's trip to Canada and help them adapt to their new home.



### Fundraising Events

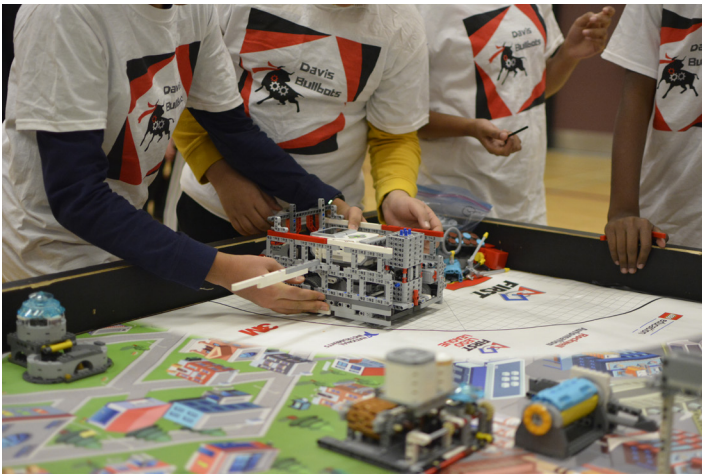
For the last several years, we have held in-school and community fundraisers, ranging from car washes to bake sales. The funds we raise through our efforts went towards helping expand our outreach programs and to help our team have a successful build and competitions seasons.

### Food & Clothing Drives

For the last several years, we have given back to our community by donating food and clothing at our annual drives. By partnering with other clubs within our school, we've gathered hundreds of food items to donate to our local food bank every year.

### Feeder School Presentations

We hold annual presentations at our local middle schools to make them aware and inspire them to join FRC. We also demo our robot to give them a taste as to what we do and the benefits of joining FRC and especially our team.



FIRST Lego League Qualifying Tournament



Demoing at FII Jr. Expo



City Hall Presentation



SEVA Food Bank Drive & Volunteering

# ACHIEVEMENTS



## QUICK FACTS & NOTABLE ACHIEVEMENTS

- Ran 70 workshops over the course of 2 years with the support from our partners at United Way and Polycultural Immigrant and Community Services. Brought on Team 1285, 6070, 6378, 4939 to support us with the rollout of these workshops to inspire and enhance their outreach so that they can take their experience and build on it in their cities. We are aiming to transform the culture of using FIRST as a vessel to provide newcomers with an avenue for opportunity and integration, giving them a place to belong.
- Demoed our robot at the FLL Jr. Expo where we spoke to FLL Jr. participants about the benefits of FRC.
- Presented our robot at a STEM conference hosted at a local middle school and spoke to their students about the FIRST programs available to them as well as the benefits of joining.
- Started collecting books and monetary fund's known as our THEORYBooks initiative at an offseason competition with hopes to carry this initiative forward into the competition season in order to bridge a literary gap in underserved communities.
- Hosted the second annual Girls in STEM Olympics in partnership with Scotiabank at the Digital Factory. The event featured a STEM-based competition, an innovation fair and a panel of representatives discussing adversity in the workplace.

***We are the role models and change makers who are creating a cultural shift in our local, national, and global communities both in FIRST and in the world.***

- Launched the Redefining Girls Campaign where we are challenging the perception of females in media and society through a visual representation of strong females that associate new adjectives with what it means to be a girl. On social media, we are sharing stories with the hashtag #RedefiningGirls and encouraging others to follow suit. We will be putting these posters up at competitions, in universities, and schools with the support of our school board.
- Brought on the females from Team 1285 to take part in our all-girls competition team by integrating them alongside our female students to run the show at the competition, with drive team and pit roles.
- In 2018, we saved FRC Team 4308 from Woodlands High School from shutting down after they lost their lead teacher by providing them with the necessary mentorship, build space, and resources to build a competitive robot.

***Not only does our team embody the goals and purpose of FIRST, but every student, mentor, teacher, and sponsor, lives and breathes FIRST's mission. We spread a culture where each individual we meet, carries forward FIRST's mission.***

- We had teams 3560, 4308, 4939, 5921, 6070, 6378, 7329 and 7664 all use our in-house Super Hub to build their robots at Rick Hansen using our machine shop and build resources.
- We brought our mobile machine shop to District competitions for all teams to use as well as provided and built practice fields which were sent to other schools and Studica for the public practice facility.
- We competed in British Columbia at the inaugural Canadian Pacific Regional with the intention to support every team competing as it was a highly rookie team populated regional since FIRST has only recently started growing in this province. Our goal was to show them the true spirit of FIRST and act as a model for these teams to emulate.
- With our trip up to British Columbia, we made connections with several FRC rookie teams whom we plan on partnering with to show them how to run Library or Community Robotics workshops in their areas, further educating their youth to enter fields of STEM and to change their culture.
- We are embodying the purpose and goals of FIRST as one of three official FIRST Canada Super Hubs and we understand the appreciation of sharing resources to help all teams be successful. This has driven us to take the FIRST Canada Super Hub program and making it global by creating partnerships with 34 teams to be a FIRST Help Hub for their region this season. FIRST Help Hubs now encompass 7 countries across 5 continents.
- In 2017, we founded The Compass Alliance with Team 125, 503, 971, 1403, 1678, 2283, 3132, 3339, and 4911 to raise the overall level of competition for FRC around the globe and provide teams everywhere with resources and tools necessary to build world-class robots. This is done through the execution of multiple programs such as FIRST Help Hubs, Tag Teams, 24/7 FIRST Help Now online service, and a FIRST Resource Repository. We are now leveraging the expertise of 59 FRC teams.



- In 2019, we were glad to announce the partnership between The Compass Alliance and FIRST Headquarters. We created resources on Sponsor Relations and Scouting, leveraging this partnership to send them to every team through the official FRC blog and make them available on the FIRST website.
- In partnership with Team 125, we worked on an extension of The Compass Alliance known as the Hear For You program, focusing on ending the stigma surrounding mental health and raising awareness for personal wellbeing. We're collaborating with FIRST HQ to create a guide for Quiet Rooms to be recommended for all competitions during the 2019 Destination: DEEP SPACE season.
- In collaboration with our school's mental health awareness club, we hosted drop-in wellness centers at our library. Through our efforts in supporting teams through our in-house Super Hub, online 24/7 Help Centre, A-Team at competitions, and direct support, we have assisted 110 FRC teams from the 2017 to 2018 season.
- Two of our alumni (Thuvishan Rajagulasingham and Simrat Sodhi) were panellists at the Girls in FIRST Weekend this summer, expressing the importance of girls in STEM and encouraging the youth towards understanding gender equity.

***Our work in one season simply scratches the surface for all that we have been doing for over a decade to spread our passion, love, and knowledge for STEM to everyone.***

***We are inspiring greater respect and honour for STEM while standing as the difference makers of today, creating the innovators of tomorrow.***

## **NEWLY ESTABLISHED PARTNERSHIPS**

### ***Polycultural Immigrant and Community Services 5-FRC Team Collaboration***

Recruited FRC teams 1285, 4939, 6070 and 6378 to help us execute 10 week-long workshops for newcomers in the 2018 off-season, impacting over 80 newcomer families. The goal was to leverage the teams' knowledge and passion to show them how they can use robotics as a vessel for creating opportunities for newcomers in their city and inspiring them to take on fields in STEM. The children we've seen go through the workshops have shown enthusiasm to join FLL/FLL Jr. teams in their communities and schools and we provided them with the information necessary to help them get involved in their schools.

### ***McMaster Engineering***

McMaster University's Engineering program is becoming a big supporter and partner in the work we are doing for gender equity. For the inaugural Girls in STEM Olympics, we hosted at our school this year, we reached out to their Women in Engineering Society to partner with us for the event and they were a massive contributor in ensuring it was successful. They came out to support us in our work, met and spoke with the young females who attended about their future paths and had a guest speaker talk at the event. We are currently working on a partnership with them for our Redefining Girls campaign where they will be providing us with the resources to make this campaign even bigger in universities and in our community through their support and advocacy. In the near future, they have also invited us to be part of a focus group to see how they are able to increase female involvement in their engineering programs.

### ***Cuso International***

We worked on building a partnership with Cuso International, a non-profit that works towards bringing education to all areas of the world and who fights for humanitarian efforts in rural areas. We contacted them at a time where they were seeking the technological knowledge and expertise to start a new program at their organization specific to STEM education. We are currently in the developing stages, creating a plan with their offices and connections to schools in Jamaica and Guyana to bring our robotics curriculums that we have developed in our school and community to integrate a technological program in these schools in the next year.

### ***The Compass Alliance***

The Compass Alliance is a project we have been working on with 9 other FRC teams from around the globe for several months prior to the announcement of who we are to the FIRST community in January 2018. The 9 FRC teams we worked with to found this alliance are teams 125, 503, 971, 1403, 1678, 2283, 3132, 3339, and 4911. We spent months researching and working hard to establish what our goals as an alliance would be and how together we can be a powerful force in taking the FIRST community to the next level. We decided our first endeavour as a team would be to combat the resource gaps between teams in FIRST which is becoming an issue with the amount of FRC teams that are starting up as a lot don't know how to be sustainable, how to gain resources or have the capacity to build a successful team. This is what we are aiming to help with, and this has been received extremely well in the community as we have already been able to leverage 59 teams through The Compass Alliance. The programs we established through this are FIRST Help Hubs, Tag Teams, 24/7 FIRST Help Now online service, and a FIRST Resource Repository. In 2018, an extension of The Compass Alliance was created known as the Hear For You program, which was created to start a conversation about mental health and provide inclusive spaces at competitions known as Quiet Rooms. With TCA's partnership with FIRST HQ, we were able to inform multiple districts of this initiative by creating planning documents which are added to every event planning documents, which were implemented in 12 competitions last year and are planned to be held at both world championships this year.

# OUR PARTNERSHIPS

## MISSION STATEMENT

Team 1241: THEORY6 believes in the power of collaboration, inclusivity, and diversity. By establishing meaningful, long-term relationships, we have been able to accomplish many goals. With the resources our partners have provided us with, our team has been able to create not only a strong presence in our local, national, and global community, but also increase demand for STEM education and creating a lasting impact on the lives of the people we meet. Team 1241 strives to create valuable relationships and welcome all into our family to provide everyone with the best experiences possible.

## PRESENT PARTNERSHIPS

### *Sponsors*

Sponsors provide financial support and aid throughout the season. Through lunch n' learn, presentations, shop tours, student curriculum nights and parent nights, we give insight about our work and our achievements, as well as attract more sponsors and show them what our team is about. We encourage them to invest in the future as our robotics program is creating tomorrow's leaders and innovators. We are able to give back to our sponsors through robot demonstrations and newsletter updates to show the employees how we appreciate their support to the FIRST program as well as how more employees can get involved. These strong connections have led to many of our students and mentors gaining sponsorships for our team, internships and coop opportunities.

### *Peel District School Board*

Our well-developed partnership with the Peel District School Board has led to us being one of the focal points in Peel for FIRST Program training. We constantly update the Director, our Trustees, Superintendents and Administration of our progress, achievements and future goals. We have led several teacher workshops on FIRST programs that have been conducted by our students and mentors. Additionally, we have hosted FLL Jr. expos alongside the Peel Board to support them in creating opportunities for students to explore the possibilities with STEM.

### *General Motors*

General Motors has been generous and crucial in our team's success as they have funded the industrial grade machine shop in our school. Through this shop, we are not only able to create world competitive robots, but we are able to branch out to local teams to help them reach newer heights and teach them how to utilize the latest technology in manufacturing. This resource also leads to creating our school's Specialist High Skills Major program in which students can specialize in manufacturing by taking courses encompassing specific skills required to pursue a career in this field. This contribution prepares many students for post-secondary and workplace admissions in STEM as they have experience with professional equipment. Witnessing our success and contributions to the community as a team, General Motors awarded us the Team of The Year award at the Detroit World Championship. Our bond with them has opened the door to countless opportunities and we will utilize this great privilege to maximize its potential.

### *United Way*

Through our sponsor, Pratt & Whitney Canada, we have made connections with The United Way. We work with them and their partner agency, Polycultural Immigration Offices, to run a weekly robotics summer camp for newcomer youth, providing exposure to FIRST programs available and igniting a passion for STEM within them. For the past two years, we have worked with the United Way to bring 100+ newcomers to our Ontario District Championship so we can introduce them directly to the FIRST community. We are working on building up our relationship with United Way through monthly updates and providing them with more chances to engage the demographics they work with, through FIRST programs.



### **City of Mississauga**

Our city has supported us in a multitude of ways from providing us with resources, partners, sponsors, to practice facilities. In 2013 during the protest of the Ontario government's passing of Bill 115, the Ontario Teacher Union initiated a strike that ended all extra-curricular activities across the Peel District School Board, we lost access to our school shop facilities and space to work after school hours. In spite of the struggles imposed on the team, our city stood behind us and provided us with a facility in the area and space at our Central Library to ensure we are able to compete that year leading to our first World Championship. Now embarking on our 9th year in partnership with the city, we worked with FIRST Canada and presented to the City Council and Mayor to bring the Ontario District Championship to our city, Mississauga.

### **Mississauga Central Library**

The Central Library has been an increasingly important part of the bridge between our team and our community. In 2011, our library program was pioneered as an attempt to reach out to the youth in our area and bring FIRST into uncharted territory. The program caused a change in the community and the library was looked upon for more than just a place for arts and literature. We continue to grow our partnership with libraries across Ontario to reach all community members with a number of different programs.

### **FIRST Canada**

Our partnership with FIRST Canada was initiated through the impact of the library program. Together we have been working to further expand the program to all of Canada's provinces for thousands of youth to get on board with STEM learning at a young age, generally between 6 to 14. This partnership has enabled our team to publish our Library Curriculum online for teams to access and opened this opportunity to all other FIRST teams. We are also working with FIRST Canada to bring our team's Badge Program to a global scale. FIRST saw the value in the program at the 2014 World Championship and we have since introduced Safety Badges, FLL Badges, Mentor Badges, as well as participation badges and are collaborating to start FTC and FRC skills badges.

### **Polycultural Immigration Services**

Our recent demos and workshops for Syrian refugee youth and newcomers introducing them to Canadian landmarks and culture through LEGO and robotics workshops led to an increase in demand in the community. We were able to run \_\_\_ and were able to bring participants to our Ontario District Championship. With this collaboration, we are providing this demographic with a place they can call home.

### **Women's Transformation Zone (Zimbabwe)**

We have partnered with Women Transformation Zone to bring FIRST into the Zimbabwean school, Glen View High 1 School. We sent LEGO EV3 kits and mentored their students through Skype sessions. Our buddy system we have established pairs our students with the students from their school which aims to provide direct support, advice, and build relationships. The partnership will be further growing as it has opened new doors for us to see how to help engage women with technology. We are currently working on the dynamics for how our students can be part of bringing technology to women in Zimbabwe to help bridge the education gap and build stronger communities.

### **Scotiabank**

Our annual Girls in STEM Olympic event is a competition to encourage females to pursue opportunities in STEM fields. The girls participate in team and solo challenges which includes public speaking, programming and design. We also invite gender equality advocates to share experiences and provide guidance. At the event, we host an innovation fair to showcase different pathways available in STEM fields with multiple sponsors, including University of Toronto, McMaster University, Baylis Medical and Quanser. This year's event was a great success because of our partnership with Scotiabank Digital Factory. They provided us with resources, support, as well as an amazing venue. This enabled us to expand our event and take it to the next level Together, we are empowering females and encouraging them to pursue their passions for STEM.

### **Studica**

Over the years, we have established a great relationship with FIRST parts supplier Studica. They also help us create field elements and have provided our team with practice space for regular use in preparing for competition season. Our students receive co-op positions at their facility, in which they are able to acquire experience in a STEM workplace environment. This year they are supporting us in our mission to expand FTC in Ontario, by helping us register one of the very first FTC teams in Canada. From this, we are actively focusing on educating our team and students through a school curriculum that we devised, creating a platform to grow the program. In the future, we want to host FTC events in the future at our school.



# 2019 EXECUTIVE SUMMARY

## **Team Number**

1241

## **Team Name**

THEORY6 (Team Hansen Experience of Robotic Youth)

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

Students build technical and interpersonal skills and connections that result in co-op, employment and scholarship opportunities. After experiencing our program, several alumni were driven to work with us to develop teams and STEM programs in areas lacking similar opportunities such as Atlanta, China, Guyana, Jamaica, and Zimbabwe. By learning the value of peer support, our students serve as mentors to the junior students on our sister team, Team 1285.

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

In 2016, we raised \$30,000 to sponsor a Syrian refugee family. To extend our reach, we recruited 6 FRC teams and partnered with Polycultural to run 70 robotics workshops, inspiring 120 newcomer families. Launched in 2017, our annual Girls in STEM Olympics has impacted 133 females, showing the pathways available to them in FIRST and the STEM community. To connect the newcomer school community, our Peer to Peer program introduces new students to our team.

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

We proposed a Badge Program (now run by FIRST Canada), providing 15,000 participants with tangible evidence of their growth in FIRST, encouraging them to keep growing. Our handbooks are translated to Arabic, Mandarin, Hindi, and Spanish to break language barriers, increasing access to FIRST programs and our team for newcomer families. We introduced STEM to our library system—a place that traditionally supports literature—with the aim of creating accessible spaces for multidimensional learning.

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

Since 2013, we've competed as an all-girls team in the offseason, inspiring girls from other teams to compete with us and follow suit. We recruited 6 FRC teams across 4 cities to run workshops with us, to showcase the value of integrating newcomer youth into Canadian STEM and FIRST communities. With FIRST Canada's support, we attended the first Canadian Pacific regional to strengthen FIRST in the west coast by setting a positive precedent for rookie teams to learn from.

## **Team's initiatives to help start or form other FIRST Robotics Competition teams**

We started 7 FRC teams through connections we established with high schools by displaying the value of bringing STEM and helping them sustain their teams. We helped one of our former students create an FRC and FTC team at her new school in Atlanta for the 2018 season, aiding them via video calls with the team and school admin. We have presented to school boards and teachers in Singapore and Ontario to show how to sustain FRC teams and engage them in FIRST.

## **Describe the team's initiatives to help start or form other FIRST teams (including FIRST LEGO League Jr., FIRST LEGO League, & FIRST Tech Challenge)**

We started 20 FLL and 6 FLL Jr. teams by hosting 142 robotics workshops through our Library Program. Upon seeing the program's success, FIRST provided libraries with grants to grow STEM education, which are currently used by 12 libraries to start their own teams. Our support for FLL and FLL Jr. teams is extended by holding demos at feeder schools and interactive sessions in our district to teach 675 school board faculty members and FIRST team coaches about forming and sustaining FIRST programs.



***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***

We ran 109 workshops to teach our school board effective strategies to mentor and assist 31 FLL teams and 190 FLL Jr. teams. Our Super Hub Program opens our facilities and machine shop to teams in need, while mentors offer hands-on and online support via emails and calls. Our A-team, a group of students and mentors, have assisted 110 teams at competitions in the last year. Our online robot and business playbooks documenting our refined practices have been viewed 15,000 times worldwide.

***Describe how your team works with other FIRST teams to serve as mentors to younger or less experienced FIRST teams (including FIRST LEGO League Jr., FIRST LEGO League, & FIRST Tech Challenge)***

We are a founding member of The Compass Alliance, a group of teams working to reduce the resource gap in FIRST globally. We help operate FIRST Help Now, a 24/7 online service for teams in need to support them in all areas of the program. To promote sustainability and collaboration within FIRST, we reached out to 34 teams to run Help Hub resource centres taken after our Super Hub model in their regions. The Hubs provide machining support, facilities and mentorship to other FIRST teams nearby.

***Describe your Corporate/University Sponsors***

Our sponsors, General Motors, Pratt and Whitney Canada, Johnston Industrial Plastics and Studica, are integral to the growth of our team as they provide us with the tools that enable our success. We have built partnerships with 3 of the biggest STEM universities in Ontario (University of Toronto, McMaster and Waterloo) who have sponsored and supported our outreach efforts. Many of our alumni are involved with these universities and team sponsors, which both us and our partners benefit from.

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

We involve our sponsors in design reviews and awards submissions, recognizing their contributions at our Kick-Off, Bag and Tag, and annual Spring Banquet events. We've held 17 showcases and demos for our sponsors to encourage employees to share FIRST's message. Pratt & Whitney Canada connected us with United Way & Polycultural to run free workshops for newcomer youth, expanding our reach. Providing us with a mobile machine shop & practice field, Studica enables us to support teams at competitions.

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

We started off within our school, teaching students soft and technical skills through robotics and STEM. Once we began establishing local projects, our focus shifted to developing core values and creating opportunities for others to learn as we had. As our initiatives grew, we stayed true to our beginnings, focusing on making STEM education accessible to all through local and global efforts. We strive to inspire other change-makers and spread equity, diversity and innovation across the globe.

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

FIRST empowers youth globally to reach their full potential as leaders in a larger community. FIRST creates highly interactive environments in which students find leadership roles, develop critical problem-solving skills and explore their passions, all while learning the importance of giving back. Through organizing STEM-based competitions, FIRST unites students, parents, mentors and professionals to collaborate on a single mission—to inspire, grow, and learn from each other.

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

We established partnerships and spread FIRST through presentations to the Minister of Science & Technology, TEDx conference, Discovery Channel, Rogers TV and held a workshop at the biggest youth STEM conference in Canada, all to showcase STEM to a larger community. Hosted FLL Jr. Expos and FLL Regionals for a total of 268 teams in the last 5 years. We assisted in developing the SHSM Manufacturing program for our school board. We've devoted over 65,000 hours to our outreach efforts since 2014.

# 2019 CHAIRMAN'S ESSAY



We are a patchwork of hundreds of different talents, ideas, and personalities woven into a single team. Tied together by our love for STEM, we've grown from cultivating local partnerships to collaboratively establish initiatives at a global level. We are the eyes that see our community's visions and the hands building them opportunities through our advocacy for future possibilities. Team 1241: THEORY6 is a family of change-makers, united in our mission to drive a new generation of innovators.

## VISION

Our vision is rooted in our unbounded passion for robotics. It drives us to innovate new ways to create change, establishing a sustainable platform to grow STEM consciousness. By sharing our vision with our community, we foster a culture of giving back, paving the way for more accessible programs in Ontario. To mobilize this goal and encourage student progression through FIRST, we created an evolutionary cycle that strengthens our community, giving students an avenue to accelerated learning.

To enhance an accessible community space, we developed a free Library Program, introducing a STEM dynamic to 12 libraries across Ontario. To encourage more libraries to offer the program, we developed a structured Library curriculum that is available on FIRST Canada's website along with grant opportunities for funding. The curriculum optimizes the delivery of workshops to ensure students aged 5-12 learn basic mechanical and programming concepts based off of FIRST LEGO League (FLL). This sparks an interest within students to join FLL Jr. and FLL teams in the future and has led to us starting 26 and assisting over 221 teams. We've further supported local teams by hosting 4 FLL Jr. expos and 8 FLL tournaments in our school. Since 2014, we have collectively volunteered over 65,000 hours in our local communities, supporting FIRST programs and beyond.

Building on the cycle, we created FRC Team 1285, a junior team for grade 9 and 10 students within our school. By creating more leadership opportunities through experiential learning, students on Team 1285 build fundamental skills in all aspects of the team. Additionally, our partnership with GM Canada funded our school's machine shop, helping us develop the Manufacturing Specialist High Skills Major (SHSM) program. 48 high schools in Ontario now offer our program, facilitating workplace experience where students gain industry-specific skills and receive a specialized certification on their diploma.

## OPPORTUNITIES

To progress our mission and facilitate growth beyond ourselves, we leveraged our experiences by connecting underserved communities with opportunities to enable their own goals. Transforming potential into practice on a greater scale, we developed programs to support newcomers, females, and underserved communities by aligning our vision with theirs.

Following the rise in Canadian immigration and refugee rates in 2016, we developed our New to Country (NTC) program to proactively support families joining our community. This was initiated by a \$30,000 fundraiser in collaboration with school clubs to sponsor a Syrian refugee family's migration to Canada. To aid NTC students in completing their 40 hours required to graduate, we implemented a peer-to-peer volunteering program at our annual FLL tournaments. Encouraging NTC families in our community to join robotics, we wrote and translated guides into 5 languages to comfortably introduce them to FIRST. Further enhancing this experience for newcomers beyond our school, our sponsor Pratt & Whitney Canada partnered us with United Way to bring 100 families to the District Championship since 2017.

Through United Way, we collaborated with Polycultural Immigration Services to hold free robotics camps connecting recently immigrated youth through STEM challenges. We recruited 5 teams from 4 cities across Ontario to ensure we had the resources to successfully host 70 workshops over the last 2 years, reaching 270 kids. We adjusted our Library Program curriculum to accommodate for language barriers, engaging participants in a hands-on, visual-based learning experience. By using LEGO WeDO for youth aged 5-8 and LEGO EV3 kits for ages 9-12, they developed the skills needed to succeed on a FIRST team. To sustain this impact, we are training Polycultural staff to run the workshops independently with 10 government funded Lego EV3 and WeDo kits.



Our advocacy for female representation in STEM is rooted in the understanding that our team is predominantly male. To challenge this, we began an annual tradition of competing as an all-girls team that takes on pit and drive team roles at an offseason event. Since 2013, we have had 66 girls pursue these roles in the regular season after their unique experiences. In 2018, we partnered with Scotiabank to host our annual Girls in STEM Olympics, a free competition focused on empowering girls aged 13-18 through CAD, programming and design challenges. Our conference sponsors, including Quanser, Baylis Medical and the University of Toronto, showcased their work at our Innovation Fair, allowing delegates to explore pathways in STEM. A panel of gender equity advocates, led by a FIRST Canada representative, discussed the adversity females face in their workplaces.

## POSSIBILITIES

In every way, FIRST is about innovating past boundaries. Our robotics experience is nothing short of just that—an opportunity to foster a love for STEM, and a way to find a community of support. Building upon existing systems by celebrating individual achievement, sharing resources, and spreading other FIRST programs, we are advancing the FIRST experience, driving possibility and paving a path to a better future for FIRST, and for the thousands of youth involved.

Teams receive trophies, medals and banners for their success, but for individuals, we pioneered the Badge Program. We proposed this idea to FIRST Canada as we sought to provide tangible evidence for the skills participants acquire through FIRST. Since adopting the program in 2016, they have brought badges to over 15,000 participants in Ontario, certifying skills attained in all facets of FIRST. This growth is an example of how we continue to create and inspire innovative programs that support and progress FIRST itself.

Sustaining the FIRST ecosystem and encouraging other FIRST teams' growth contributes greatly to our own success as a team. As the original FIRST Canada Superhub, we facilitate the success of local teams by providing mentor support, access to our machine shop and donating robot parts. Every year during the build season, our facilities are home to not only us, but at least 7 other local FRC teams. Our published business and robot playbooks outline the team's practices for build season, which have been downloaded over 15,000 times online. At competitions, students and mentors on our A-Team troubleshoot for other teams to ensure all robots make it onto the field and perform to the best of their ability. Since 2018, we have assisted 110 FRC teams, advancing the field of play in Ontario.

In 2017, we founded The Compass Alliance (TCA) with 9 other FRC teams from around the world, with a goal to bridge the resource gap and level the playing field amongst FRC teams. We elevated the Canadian Super Hub program to an international platform, as Help Hubs. As of 2019, 43 teams across 7 countries have become Help Hubs. This past year, we partnered with FIRST HQ to identify and create integral resources, such as an intro to Sponsor Relations and Scouting, sent to every FRC team and available on the FIRST website. We aim to create a platform that all teams can connect with, regardless of experience level or location, creating the ultimate FIRST resource pool.

As robotics is a fast-paced experience that may be stressful and anxiety-inducing, we have been working equally as fast to create an accommodating space for all participants. As a branch of TCA, we are working on the Hear For You (HFY) program to break down the stigma surrounding mental health within the FIRST community. We are bringing Quiet Rooms, started by FRC Team 125, to Ontario as a de-stress and break area for participants at FRC competitions. In partnership with FIRST HQ, we worked on a guide outlining the Quiet Rooms' execution plan, which will be added to all event planning documents for 2019.

We are on the forefront of FIRST Tech Challenge (FTC)'s integration into FIRST Ontario, beginning in our own community. By revising the robotics and control systems course in our school to incorporate and familiarize our team with the program, we're making it easily understood and teachable in the future. Studica, one of our key sponsors and a distributor of FIRST parts, is supporting us in this mission by helping our students build and register an FTC robot and team during their co-op placements in July 2018. Our commitment to one day hosting the inaugural FTC event in our district is fueled by the belief that there should be a FIRST program available for everyone in Ontario.

Team 1241: THEORY6 is built on the recognition that our success stems from a network of local support and the value of having a wide sustainable impact. Empowered by our vision for the world, we use robotics as a catalyst to shift the culture around STEM in our society. Broadening our horizons to provide every community with opportunities, we strive to enable others to explore their passions and develop their skills. Building on FIRST programs to maximize student success within and beyond FIRST, we are creating possibilities for boundless growth. By paving a path to mobilize our vision, we are sharing unique experiences to create an impact as a community of changemakers far greater than any made on our own.