

## SWAT Chairman's Essay 2016

St. Mildred's Women Advancing Technology (SWAT) 771 is a group of passionate and inspired young women with the mission to share and grow a love for Science, Technology, Engineering, and Math (STEM). SWAT has created a 5-part mission; to ensure a sustainable future within their school, advocate for FIRST in their community, create nationwide STEM enthusiasts, spread international influence, and give back to their very own family, FIRST.

Within St. Mildred's-Lightbourn School (SMLS), an all-girls school in Oakville, Ontario, Canada, SWAT has established a STEM-based program in every grade level from Preschool to Grade 12. Starting with a preschool robot demonstration SWAT aims to introduce the world of STEM to the youngest students. From Grades 1 to 4, four non-competitive Junior FIRST Lego League (Jr. FLL) teams are available. SWAT runs an annual Jr. FLL showcase to allow the girls to share their learnings with the community. Girls in Grades 5 to 7 have the option to join one of two FIRST Lego League (FLL) teams, and all students in Grade 8 experience VEX robotics as part of their science curriculum. SWAT's approach to sustainability has been met with significant positive results as 68% of current SWAT members having participated in one or more of the previous programs. In the past 15 years SWAT has grown from 5% to 25% of the SMLS high school population. The leadership role of a STEM Robotics (STEMR) Prefect has been held by a SWAT member since its inauguration.

SWAT has created numerous leadership positions such as Outreach, Inreach, Mechanical, Programming, Electrical, Business, Media, FLL, Jr. FLL, and Awards Leads in order to challenge their girls. The role of a Jr. Lead has also been created to ensure sustainability over time for SWAT as a whole. Their macromanagement style makes SWAT not only an after-school club, but a life changing experience.

All of SWAT's Grad Year students have gone onto receive post-secondary education with acceptances in the world's leading universities such as the California Institute of Technology, University of Pennsylvania, Cornell University, and Imperial College of London. Last year 98% of SWAT girls achieved Honour Roll. SWAT alumni continue to stay in touch through team-held and FIRST events as well as social media.

SWAT makes an effort to reach out to people who are not typically exposed to STEM in their everyday lives. SWAT girls advocate for FIRST in their community by showcasing their robot at various local events such as Big on Bloor, Oakville Ribfest, Port Credit Buskerfest, and Midnight Madness. With the combined efforts of the team SWAT has been able to reach out to over 300,000 people in their community.

As a member of the FIRST community SWAT knows the value of their mentors and sponsors, and is eager to support mentors in personal goals such as the Road Hockey to Conquer Cancer and Movember. SWAT girls run a successful event with Ford every year in which people are able to test-drive cars and SWAT earn financial sponsorship for every car driven. Lastly, SWAT hosts an annual Thank You Banquet to show their gratitude for the support given to the team. The product of these efforts and the relationships built between SWAT and their community are remarkable.

In 2015 SWAT held their first ever STEMinism conference, featuring incredible speakers such as Kirstine Stewart, the CEO of Twitter Canada. 'STEMinism 2016: #ILookLikeASTEMinist' will be held at The University of Toronto in April with 175 participants from 10 schools. SWAT has gone as far as building a committee of students in the Greater Toronto Area to help organize this event. Their mission is to inspire discourse in terms of gender representation within STEM-related fields, through the engagement of high school students they hope to promote diversity and inclusivity on an intergenerational scale.

SWAT is working hard to create nationwide STEM enthusiasts by bringing diverse people together in a celebration of STEM. SWAT has been featured on multiple TV networks such as TVO Kids, CBC, and CTV, allowing for exposure amongst a variety of audiences. SWAT also is publishing a book titled "Millie Finds a Wrench". The book follows Millie, a little girl who finds a wrench and explores the possibilities of her new tool. SWAT hopes that this book will be published by the end of 2016.

In 2013, with the help of Cisco SWAT was able to ensure a sponsorship for every all girls FRC team, as well an annual scholarship to recognize a girl who went above and beyond the expectations of her team.

SWAT has also been working with the Canadian federal government to address their cause. Mrs. Dorothy Byers, head of SMLS and dedicated mentor, addressed the Standing Committee about the status of women on behalf of FIRST Robotics Canada. Mrs. Byers spoke about the role of women in technology and how FIRST is working to develop gender equality in the hopes of systemic change. Mrs. Byers made recommendations to the Standing Committee including the creation of a Minister of Technology and government funding for the growth of FIRST Canada. Justin Trudeau's government implemented an additional Minister of Science this past November, with the role filled by a woman.

The FIRST community is constantly growing and SWAT plays an active role in this development. Since its establishment, SWAT has started 35 Jr. FLL teams, 24 FLL teams, and 5 FRC teams, as well as mentored 20 FRC teams. Last year, SWAT was able to mentor the first FRC team in British Columbia, Team 5742. They've also helped start the first FLL team in Cambodia and have been supporting them as their team grows.

This year marked the 5th 'SWATposium', an annual FIRST symposium consisting of guest speakers and team-run workshops. SWATposium is a helpful resource for new FIRST teams, hosting around 5 rookie teams each year. This year with an attendance of 250 people, from 18 FRC teams and 6 FLL teams, SWAT hosted 28 different workshops on a variety of topics. 'SWATposium' not only serves as a database for current FRC teams but often helps individuals not yet a part of the FIRST community gain interest. This year SWAT had 20 individual attendees interested in creating their own FRC teams.

For the past two years, SWAT has been working beyond FIRST Canada to reach out to the FIRST community on an international scale. In 2014, the team started and mentored the first team in Beijing, China, team 5449. Looking to expand their relationship with teams in Asia, two SWAT girls travelled to China in July 2015 to volunteer as mentors and translators for the Maker Camp hosted by the China Urban Robotics Youth Alliance (CURYA). At this event the girls were able to support 20 FRC teams and had the opportunity to directly mentor ten of those teams. Looking to involve other SWAT members back home, an E-Symposium was organized with teams and the Director of CURYA. With FIRST Canada's support, five SWAT girls took the concept of 'SWATposium' and made it available to the Chinese rookie teams by video conferencing to share information. Acknowledging the internet firewalls in China that limit the access of FRC information, SWAT worked with FIRST teams 4001 and 744 to build [asiafrc.com](http://asiafrc.com). In less than a year the website already has 162 articles, 44 pages, and over 120 000 views. SWAT's relations with the Chinese FRC teams grow as one girl will be attending the Hawaii Regional to mentor team 5832.

SWAT's role in spreading the international influence of STEM and FIRST is astounding; the team has reached 28 countries in 6 of the 7 continents. SWAT girls are leaders in taking a

charity-based approach to help people all over the world explore STEM. In the last 2 years SWAT has partnered with charities such as Mully Children's Family (MCF), Doing Wells, and Advanced Collision of Kids International to deliver LEGO in order to spark innovation and creativity within the minds of young children who otherwise would not have this opportunity. In March 2014, nine SWAT girls and a mentor organized an initiative with MCF to visit Kenya and build a nursery. Prior to their journey SWAT worked with Ontario's Minister of Labour, Kevin Flynn, to collect LEGO in their community. A SWAT captain also travelled to rural Poland, where she visited 13 terminally ill children. SWAT sponsored this venture by donating robotic toys to each child visited.

SWAT has also been sponsoring young Kenyan girls, for the past eight years. A SWAT girl sends out a letter every two weeks to Laura, our sponsored girl, updating her on the team's progress, and learning about Laura.

SWAT is part of a Round Square school, allowing for the girls to reach out to 150 schools globally in over 40 countries. SWAT girls have brought their passion for STEM on exchanges in various countries such as Australia, Colombia, Scotland, Chile, Sweden, Japan and China. On average each build season SWAT hosts 5 exchange students, who are able to get involved for the duration of their stay. This current build season, SWAT has played host to 9 exchange students. SWAT is in close contact with all of their contacts in order to eventually establish FIRST teams with them.

SWAT uses social media as a way to share their love for STEM with people all around the world. SWAT's social media includes an active website, Twitter, Instagram, and Facebook where SWAT is able to share their numerous resources. With multiple active hashtags and followers, their tactic proves to be successful.

The team name depicts the girls to only advance technology, however this group of empowered girls is able to advance much more. SWAT girls are advancing the way people view STEM in our school, local community, country, FIRST, and the world. They've advanced the predeceased notion of women in robotics and the outlook of STEM in society. SWAT girls know that they don't only build a robot, after all, their 5-part mission has just begun.