

For the past 16 years, St. Mildred's-Lightbourn Women Advancing Technology (SWAT) has brought life to their tagline "Girl With Wrench". Team members have embodied the vision of FIRST by inspiring others to develop an avid passion for Science, Technology, Engineering, and Math (STEM). Since their founding, SWAT has established distinct goals: to share the ideals of FIRST in their school, local, national and global communities whilst giving back to the FIRST program itself. This year, SWAT has emphasized the importance of action in conjunction with demonstration.

SWAT 771 is from St-Mildred's-Lightbourn School (SMLS), an all-girls school in Oakville, Ontario, Canada with a Mission to develop courageous girls who challenge and change the world. Created in 2001, SWAT was founded by two high school students who proposed an SMLS robotics team to their Head of School. Since then, SWAT has become the largest extracurricular activity at SMLS, and its size has increased by 500% since their founding. SWAT 771 now has 50 contributing members, equivalent to 25% of all SMLS high school students. Since its establishment, 100% of SWAT graduates have pursued post-secondary education, many studying at prestigious universities across North America such as the University of Pennsylvania and Cornell University. Last year, 8 of the 11 SWAT grads went on to study STEM-based university programs, the remaining 3 are studying programs in the fields of business and media arts inspired by their position on SWAT. Numerous SWAT alumni also visit and support the team.

Over the past decade, SWAT 771 has become a 100% student-run team. In 2014, SWAT adopted a macro-management style system, which is similar to systems used in engineering firms such as Hatch and UTC Aerospace Systems, where many Girls With Wrenches have completed internships. Through this system, older members of the team have the opportunity to apply for a "Lead" position on the team, and younger members have the opportunity to apply for a "Junior Lead" position. These roles help both Leads and Junior Leads further develop their responsibilities on the team. This structure has been extremely successful and aids Girls With Wrenches in developing their leadership skills and creating goals within SWAT.

Girls With Wrenches have worked tirelessly over the years to maintain a FIRST based program in every grade level at their school. Starting in Preschool, they give a robot demonstration to the younger girls inspiring them and leaving them with a memory they won't forget. Throughout Grades 1- 8, SWAT 771 offers students the opportunity to join 1 of the 3 Junior FLL teams or 1 of 2 competitive FLL teams. SWAT has also incorporated the VEX Robotics program into the Grade 7 science curriculum, where students can receive a hands-on experience building their own robots. Finally, the FRC program is offered for high school students. Girls in Grades 9-12 are also offered the opportunity to apply for the SMLS STEM Council. The STEM Council, led by the STEM Prefect (a role created by SWAT), advocates the importance of STEM in our school by organizing STEM related events such as Mole Day and Pi Day. This year, SWAT implemented a new program for SMLS students called Hackathon Club. Hackathon Club is run by Girls With Wrenches with the goal of teaching younger students the

basics of coding. With this new initiative, SWAT 771 has developed an app for rookie teams called “FRC Rookie 101”, which is currently in beta. The app will be available in time for the 2017 Competition Season and will provide helpful tips and useful information for teams new to FIRST Robotics.

SWAT 771 strives to inspire and spread the word of FIRST not only in their school, but also in their local community. Girls With Wrenches can be seen at local events such as Oakville Midnight Madness, Hour of Code, Oakville Ribfest, Special Olympics, the Oakville Christmas Parade, and the Oakville Jazz Festival. These events have given SWAT the opportunity to reach out to a diversified population, and helped them impact approximately half a million people. Last summer SWAT received a visit from the Mayor of Oakville and also keeps a relationship with the Oakville MP John Oliver and MPP Kevin Flynn. They also transitioned from a one day demonstration of their robot, to a one-week program (focused on building and programming Lego robots) at SMiLeS Camp, an SMLS summer camp for children aged 4-10.

SWAT continues to work closely with FIRST to create and host Junior FLL showcases where nearby teams can demonstrate the work they’ve accomplished during their season. They’ve also started a total of 35 Jr. FLL and 24 FLL teams across Canada, many in their own school. This fall, SWAT 771 partnered with CAGIS (Canadian Association of Girls In STEM) by hosting and mentoring their FLL team. Over the years, SWAT has started 5 FRC teams (including the first team in Vancouver, British Columbia) and mentored 13 FRC teams. Not only does SWAT mentor and help teams during their season, Girls With Wrenches also recognize the importance of sportsmanship by supporting struggling teams at competition. SWAT 771 can regularly be seen assisting other teams around the pits.

In an effort to show gratitude for their sponsors, SWAT aims to host events that support both groups involved. An example of this would be their Drive One event. Drive One is a SWAT-hosted event featuring multiple cars available for test drives from our sponsor, Ford. Ford works jointly with SWAT to raise team funds for every car test driven. SWAT shows their appreciation to their mentors and sponsors by hosting a Thank You Banquet at the end of every season. Special acknowledgements are made to all mentors as well as sponsors to show our appreciation for their support, and expertise throughout the year. Each year SWAT nominates a mentor for the Woodie Flowers Award. As of now, one of our mentors has received this award, and the team is confident that others will as well.

SWAT will be running their third annual STEMinism conference [include date/timing], hosted and sponsored by the University of Toronto. This conference hosts speakers and workshops to inform and raise awareness about gender equality in STEM related fields, as well as promote STEM at a high school level. There is to be an estimated 225 attendees from over 10 different schools across the Greater Toronto Area. STEMinism has had many incredible speakers such as Kristine Stewart the CEO of Twitter Canada. SWAT was the first all-girls team in Canada, and since they were founded, they’ve been involved and in contact with the 4 all-girls teams that currently exist in the country.

On a national level, SWAT is excited to announce that they will soon be publishing a children's book titled "Millie Finds a Wrench". The book tells the story of a young girl named Millie who discovers the possibilities of women in engineering. Once the book is printed, SWAT plans to distribute it to the Junior School classrooms within SMLS. Many articles have also been released about the team by media outlets such as The Oakville Beaver Newspaper and Owl Magazine, an educational magazine for kids. In order to further their advances for women in STEM, last year, SWAT's founding mentor, Mrs. Dorothy Byers, addressed the Standing Committee to the Federal Government on behalf of FIRST Canada on the role of women in STEM. Mrs. Byers strongly advocated for an increase in funding for FIRST and a Minister of Science to be implemented. In November 2015, Kirsty Duncan was appointed the Minister of Science.

Girls With Wrenches understand the value of giving back to the FIRST community. Last year, SWAT took part in the "Ask The Experts" Webinar, where they spoke about starting outreach opportunities with other FRC teams. SWAT 771 also started the first ever FRC team in Beijing, China: Team 5449. In 2015, 2 Girls With Wrenches travelled to the Maker Camp hosted by the China Urban Robotics Youth Alliance, where they were able to help 20 FRC teams and directly mentor 10 teams. Throughout this year, the girls continue to assist these teams, and over March Break they travelled with Team 5832 to compete with them at a Hawaii regional where they won the Rookie All Star Award. SWAT acknowledged the firewalls in China that prevented access to FIRST information and worked with 2 other FRC teams to create asiafrc.com. Regular updates and team resources are posted on this website to help teams in need of extra support. Currently, the website has more than 50,000 viewers and 150 articles. Finally, this year, SWAT once again ran the largest annual FIRST Robotics symposium in Canada, also known as SWATposium. This year there were 250 attendees, as well as 30 workshops covering all aspects of FIRST. In 2016, for the first time ever, SWATposium was livestreamed on YouTube. Two live workshops, as well as the opening and closing speakers are now available online for teams to access worldwide.

SWAT continues to spread the word of FIRST to communities not usually exposed to STEM on a global scale. In the recent past, Girls With Wrenches have travelled to both Kenya and Poland on service trips. They've also reached out to Australia, Chile, Poland, Sweden, Columbia, Scotland, Japan and China in collaboration with the SMLS Exchange program, where they've introduced FIRST to hosting schools. For 8 years SWAT has sponsored a young girl in Kenya named Laura. Throughout the year they send her letters to get to know her better and give her updates on the team. This year, SWAT started a new initiative called "Flat Swatties". Girls With Wrenches take "Flat Swatties" on their travels around the world, tracking the global learning and experiences of members on the team. Finally, SWAT 771 is active on many social media platforms such as Facebook, Twitter and Instagram.

Girls with Wrenches know that they don't just build a robot, the robot builds them. It is undeniable that SWAT 771 dares to create systemic change, develop courageous girls, and

advocate for gender equality in STEM, while engaging all generations through the opportunities presented by FIRST.

ADD CONCLUSION

Character count: 10,327

*HACKATHON AT LINBROOK NOW

5832 mentored - > went to hawaii

Got rookie all stars -> qualified

Not included

1. A Full Tank of School Sustainability

- Cad training & Merry Movie Night
- *SWATTIE of the month
- Project management
- Mini millies: SWAT works to ensure that the team continues nurturing passion and talent as well as helping its members learn and continue to broaden their leadership skills now and in the future. In order to guarantee sustainability for the future, SWAT **created a program** within the team called Mini Millies. An older member of SWAT acts as the mini millie leader, and each one supporting the younger girls reach their fullest potential and exceed both academically and socially within the team. Last year, 98% of Girls With Wrenches achieved Honour Roll, given to students who have excelled academically, with an academic average of 80% or higher.
- Last year, 8 of the 11 SWAT grads went on to study STEM-based university programs, the remaining 3 studying programs both in the fields of business and media arts, related to their position on SWAT.
- One of SWAT's founding members, an engineer employed in Calgary, has been instrumental in bringing the FRC program to her work area, and took a lead role in the FLL program there.

2. An Interstellar Team of Local Advocates

- Linbrook
- Wrench Program

3. An All-Star Homebase Unit for National Awareness?

4. A Nuclear Takeoff Blast of First Development

- Creating teams (Add CAGIS FLL team)

5. A Shining Crew of International Aerospace Engineers

- Exchange - Ukraine?
- DoingWells
- Wrench Program (listed under #2)

*app/hackathon

*Swatposium streaming

Millie finds a wrench

Great job freshening the content.

Perhaps consider discussing the shift in outreach from presentation to action. While presentation will continue i.e Ribfest and Midnight Madness, we are trying to include more opportunities for SWAT to work one on one with young people to give them a positive experience with STEM i.e. expanding Smiles Camp from a one day demonstration to a week long program to build, program and play with a Lego robot. Or the CAGIS demonstration and games day which is now a fall FLL team.

Additionally, this year SWAT has introduced the roles of Project Management Directors, who monitor and direct all of SWAT's tasks for the year.

50 000 people for Midnight Madness

46 564 people for Oakville Beaver

30 000 ribfest

239 335 owl magazine

(25) Hour of Code

70 Special Olympics

Oakville Christmas Parade

Oakville Jazz Festival

30 SMiLeS Camp

Total so far: 366, 024