

St. Mildred's Women Advancing Technology (SWAT) is an all-girls FIRST Robotics Competition (FRC) team from St. Mildred's Lightbourn School (SMLS) in Oakville, Ontario. Since its creation in 2001, SWAT has been striving to inspire society's driving forces by sharing the possibilities within Science, Technology, Engineering, and Math (STEM). As a team, SWAT aims to create a sustainable future at their school, showcase FIRST within their community, "Make it Loud" across the country, and inspire students around the world.

Creating a Sustainable Future

In order to create a sustainable school environment, SWAT has implemented a STEM based program in every grade level, immersing girls from Preschool to Grade 12 in STEM opportunities. Beginning at the age of four when girls are learning the letter 'R', SWAT demonstrates their robot, encouraging the girls to forever associate the letter 'R' with the word robot. From Grades 1 to 4 girls have the opportunity to join one of three Junior FIRST Lego League (Jr. FLL) teams. SWAT hosts an annual Jr. FLL showcase at the end of the two seasons in order to allow local teams to demonstrate their learning from the season.

In Grade 5 to 7 girls can join one of two FIRST Lego League (FLL) teams. SWAT developed and integrated VEX Robotics teams into the grade 8 science curriculum ensuring that every girl at the school has hands on robotics experience. SWAT girls mentor all of these programs, acting as role models for the younger girls in the SMLS community. In the current season, SWAT has seen a large impact from the inception of these programs, with 68% of SWAT girls having participated in one or more of them.

From Grade 9 to 12, girls can join SWAT in the FRC program. In 2012, SWAT created the leadership role of STEM Robotics (STEMR) Prefect, which has been embodied by a SWAT girl ever since. The STEMR Prefect leads an active STEM council that runs school events such as Mole Day, Pi Day and An Hour of Code. By implementing a strong STEM program at SMLS, SWAT is able to ensure that STEM is held in the same regard as the arts and athletics within their school community.

Over the past 14 years, SWAT has grown from 5% to 25% of the SMLS senior school population. Last school year, 98% of SWAT girls achieved Honour Roll proving their high academic achievements throughout the year. Since the team's inception, 100% of graduates have gone onto post secondary education at leading universities around the globe such as the California Institute of Technology, Cornell University, the University of Waterloo, Imperial College of London, and many others in the past year alone. SWAT builds a strong network of alumni through returning mentorship, active online groups and alumni events. SWAT alumni continue their involvement with the FIRST community by volunteering at events and mentoring other FIRST teams.

During their time on SWAT, girls are encouraged to take on leadership roles on the team. The Leads Program allows experienced girls to succeed as the Outreach, Inreach, Mechanical, Programming, Electrical, Business, Media, FLL, Jr. FLL, or Awards Lead. This year, SWAT initiated the Junior Leads Program, which allows first or second year SWAT girls to shadow one of these Leads and gain further

insight into the team. Through this macro-management style, SWAT is able to ensure sustainability in all aspects of the team.

Showcasing FIRST

SWAT strives to not only reach out to the SMLS community, but also to the Greater Toronto Area (GTA). By hosting various outreach events with their local community SWAT is able to promote STEM to a broader group of people. In the past 3 years, SWAT has presented at various schools such as E.C. Drury School for the Deaf, W. Ross McDonald School for the Blind, Trillium School for Learning Disabilities, and Oliver Smith, a First Nations school.

Through their local outreach, SWAT promotes STEM to a diverse population. SWAT achieves this by running activities for local camps and organizations, such as Appleby Camp, Saga Camp, SMiLeS Camp, SENACA Seniors Day Program, and the Canadian Association for Girls in Science. SWAT also demonstrates their robot at numerous local community festivals such as Big on Bloor, Oakville Ribfest, Oakville Jazz Festival, Port Credit Buskerfest, Ontario Science Centre and Midnight Madness.

SWAT recognizes the strong contributions made by their mentors and sponsors, and works to reciprocate these contributions in order to express their gratitude. SWAT supports mentors in individual endeavors such as Road Hockey to Conquer Cancer and Movember. SWAT also hosts events with their sponsors such as Toyotoshi Drive One in order to get the community interested in both Toyotoshi Group vehicles and FRC, benefitting both the sponsoring company and the team. Additionally, at the end of each season, SWAT hosts a Sponsor and Mentor Thank You Banquet, where SWAT girls are able to thank everyone who helped the team throughout the season.

Since 2010, SWAT has run ‘SWATposium’, a FIRST symposium consisting of guest speakers and workshops, giving teams an opportunity to network and learn from one another. This year, 23 workshops were presented covering a wide range of topics for all skill levels. SWATposium is a helpful resource for new FIRST teams, hosting an average of 5 rookie teams each year.

As an all-girls team, SWAT feels it is important to celebrate women in STEM who inspire girls to pursue their passion in this field. This April, SWAT is hosting their first annual ‘STEMinism’ Conference, inviting five all-girls schools in the GTA to participate in a day of STEM-based activities. By displaying their passion for STEM in the local community, SWAT aims to spark this passion in others who may have not yet been exposed to this field.

“Making it Loud”

SWAT works closely with FIRST Canada in order to help grow FIRST programs across the country. Since SWAT’s establishment, they have started and mentored 30 Jr. FLL teams, 22 FLL teams, and 16 FRC teams. This year, SWAT was successful in starting the first FRC team in British Columbia, Canada and is currently mentoring them throughout the season. In the past, SWAT has helped FIRST

Canada by hosting an ‘Ask the Experts’ Webinar, and presenting at a FIRST Canada Board of Directors Meeting.

SWAT worked closely with Cisco in 2013 to establish a sponsorship for every all-girls team in Canada, as well as an annual scholarship awarded to girls who act as leaders in the FIRST community.

SWAT has been interviewed on television, reaching people across Canada on TV specials such as TVO Kids, CBC, CTV, and Breakfast Television. This year, SWAT is partnering with the Toronto Argonauts to demonstrate FRC at a halftime show of a Canadian Football League game. As an initiative to spark young girls’ interest in STEM, SWAT is publishing a children’s book titled ‘Millie Finds a Wrench’. This storybook will encourage children to be exposed to STEM the same way they are to other concepts often discovered through reading picture books. Over the past few years, SWAT has put more effort towards “Making it Loud” all across the country.

Inspiration Overseas

SWAT uses social media as a way to share their passion 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 including SWATposium resources.

As a new initiative this year, SWAT has partnered with a student run charity called ‘DoingWells’. This charity provides clean water for impoverished communities in third world countries. SWAT sends LEGO with the students who visit these communities in order to spark innovation and creativity within the minds of children who otherwise would not have this opportunity.

In March 2014, SWAT organized a similar initiative with the Mully Children’s Family (MCF). MCF is a charity that takes in Kenyan street children to offer them a better future. Nine SWAT girls and one mentor had the opportunity to visit one of the MCF homes, where they built a nursery. Prior to the journey, SWAT worked with Oakville’s Member of Provincial Parliament and Minister of Labour, Kevin Flynn, to collect Lego in the Oakville community, which was donated to the MCF home visited by the girls. SWAT has also been sponsoring a young Kenyan girl, named Laura Odoyo who receives letters from a SWAT girl once every two weeks.

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 she visited on her trip. SWAT started the first FLL team in Cambodia and has been mentoring and supporting them as their team grows.

SWAT reaches out to schools globally, in order to eventually establish FIRST teams with them. SWAT girls have brought their passion for STEM on exchanges in various countries such as Australia, Colombia, Scotland, Chile, Sweden, and China. On average each build season SWAT hosts 3 to 5 exchange students, who are able to get involved for the duration of their stay. As a result of having built lasting connections with schools around the world, this season SWAT has been successful in starting FRC

team 5449 in Beijing, China. In total, SWAT has been able to connect with people from 28 countries in 6 continents. SWAT girls have truly been able to spread their passion far beyond the borders of Canada.

As a team, SWAT embraces the principles that form the foundation of the FIRST movement. When asked about SWAT, Dr. Woodie Flowers, FIRST Executive Advisory Board Co-Chair, was quoted saying, "I love what you guys are doing and love having all-girls schools aggressively participating in FIRST activities." SWAT is proud of what they have accomplished over the past 14 years. Every girl on SWAT is not only active in building a robot, but is also exposed to a unique culture that allows her to develop into a confident, empowered woman.