## emPOWER women TOgetHER

RoboGirls 4440X

Our Lady Queen of the World Catholic Academy Richmond Hill, Ontario, Canada

Ava, Camila, Colin, Eva, Jacqueline, Keira, Lorena, Shiley





A casual selfie of the team taken shows various members of the team working on one of the greatest challenges yet - attaching the wheels!

At *RoboGirls*, we started out in September with the desire to succeed in our pursuit of robotics but also succeed in our mission to foster an inclusive community for all members. Initially, we heard about the team from our school, and we met at the first meetings teaching us about VEX Robotics. Meeting each other for the first time, we set out goals as a team while taking into account our background knowledge. Having different experiences in the field of STEM as a whole, we encouraged one another to share opinions freely and ask guestions whenever needed. Each member is unique and provides their own perspectives, and allowing them to express themselves in the way that they are comfortable with enables us to create a more diverse culture. Through our inclusive views and active encouragement of a diverse and safe environment for all people, we are truly a girl-powered team.

Our team has had the pleasure of collaborating with two formidable mentors from our school, Mrs. Estelle Wang and Mr. Michael Morrison. Both teachers are profusely dedicated to developing our understanding of robots in relation to computers and coding. Ms. Wang is commonly involved in STEM subjects and recently started her robotics journey. Her positive outlook on learning prompts us to never shy away due to lack of experience. She inspires us to reach our full potential and constantly supports the team's objectives. Due to her involvement in STEM, she understands the difficulties that are oftentimes faced by women pursuing such passions, recognizing that we are typically discouraged from the sciences, and therefore does her best to encourage us regularly.



From left to right, we have Shiley, Ava and Camila re-adjusting the wheels. Colin is coming over to help, and Mr. Morrison is helping another student in the background.

Our other mentor, Mr. Morrison, has helped all of us become involved in computer-related activities like robotics and computer science, being the computer science teacher. He makes us feel like we belong in STEM, he motivates us to do our best and he welcomes us without regard for experience. In our school robotics team Mr. Morrison encourages us girls, regardless of our status as a minority. He inspires us by offering good constructive criticism without discouraging us as beginners with a growing passion for robotics. Since he's involved in other things related to robotics, he also gives us good advice in terms of post-secondary education and encourages us to continue with engineering and robotics in university.

This non-judgmental mindset created a welcoming environment that was appealing to those of us who weren't already exposed to robotics, but were eager to take on the challenge. This team attracted people from different academic backgrounds, where we have people from both French Immersion and Advanced Placement programs. We are also made up of different ethnicities and ages, which gives our group even more diversity in terms of perspective. Regardless of our

differences, due to the fact that we are a team of mostly girls, many of us have had shared experiences. We support and have fun together, often going out on pizza runs when the group gets the overwhelming urge to stuff our faces with a greasy cheese pizza or three!

The different levels of experience made for diverse opinions on appropriate next steps at each stage in the robot development and because of our limited experience, we were able to get very creative. It is encouraging to be surrounded by team members that have a balance between dedication and having fun because building sessions never feel like a chore, rather, they are activities that we all look forward to.



Eva, Lorena, Keira and Colin work together to tighten washers and loose bolts on the robot, it being a two-person job for each.



Here's Shiley and Ava working on the conveyor belt! They researched and learned how to make a conveyor belt and are implementing it together.

With different minds, interests, skillsets and experiences, our members naturally gravitate to certain roles on our team. However, we are sure to encourage each other to try on different roles even if some may have less experience because we know the importance of a well-rounded robotics team. With positive reinforcement and establishing a no-judgment zone, we have an understanding as a team to help each other learn even if we're new to something; we are sure to create an encouraging environment. Despite some members focusing on certain aspects of the robot more, we collaborate and are all involved in the development of each aspect of the robot. When we delegate tasks, everyone

receives a role, however, members can choose their role based on their individual skill set.

For example, we're currently building the robot and, although some of us are more hardware-oriented, we each have our own parts of the robot that we are building; we have three

people working on the conveyor belt to pick up small objects, we have three people working on the general structure of the robot, and we have two people working on the two lifts that we are incorporating into our design. When we begin coding and driving the robot, there are some of us with more expertise in these areas, however, we will divide up the work to stay organized and lighten the load. When those of us with less coding experience tackle their coding-related tasks, those of us with more experience will guide them through their learning encouragingly. From the experience of working with each other through different roles while having different skill sets, we have learned to collaborate with each other as fellow team members and as friends.



Before the winter holidays, Colin helps Eva and Lorena (not pictured) transport the robot to their house.

We have learned to work with different personalities and have fostered uplifting relationships, where the skills that each one of us has to offer complements one another, allowing us to grow



Eva, Lorena, Keira, and Colin are working together to attach a lift to the robot Some of us had more hands-on practice than other with the hardware aspect of the robot at this point, so we were helping each other learn.

together and ultimately, be better together. Finally, we've each become better leaders through the experience of helping each other. This is what we believe being truly girl powered means: uplifting each other as fellow young women and encouraging each other to feel like we each belong in robotics, no matter our experience.

We believe diversity of perspective, problem-solving and personality are what has made working together more efficient and exciting. Our team members come from different backgrounds, grades and have different interests outside of school. This variety in experiences allows for different outlooks when faced with a challenge.

This leads to interesting discussions and debates that allows us to find the best possible solution, while learning from the expertise of others to build new skill sets.

When presented with the honour to be aided with the knowledge of an experienced robotics team from a different school, our team of resourceful women approached this opportunity with open minds and an acceptance of potential failure in the process of learning.



Lorena and Jacqueline build on their collaboration and teamwork skills by working alongside of a member from another team. They also develop their critical thinking skills while trying to discover the most efficient way to connect various parts.

"We are not only team members; we are friends that support each other"



*RoboGirls* is a proud representation of how women can change the world and make an impact no matter how small. Our team hopes to create a more diverse culture, not only in robotics, but also within STEM. We strive to always do our part to change the face of STEM by continuing to create an encouraging and welcoming environment on our team where all members are accepted, and differences are celebrated.



Here are Robogirls altogether supporting one another and bonding despite the minor setback from the COVID-19 Pandemic (January 2022).