

TEAM 6546C
SINGAPORE

GIRL POWERED

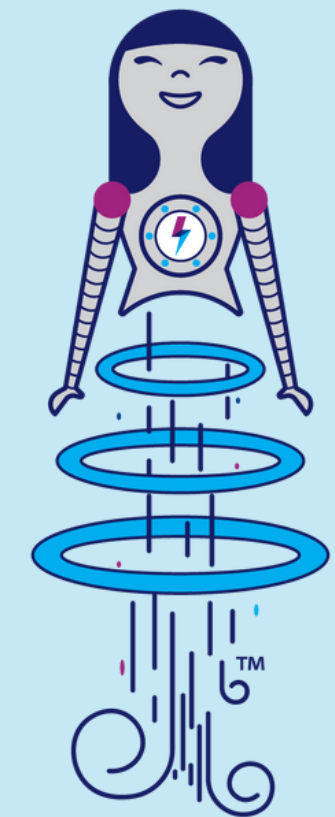
AIMING FOR OPPORTUNITIES

AMELIA WONG, KI ON DU, NICOLE YANG, SAMMIE XIE, YOYO BAO

Independence, empowerment, confidence. These are the words that come to mind when people hear the phrase “Girl Powered”.

But to our team...

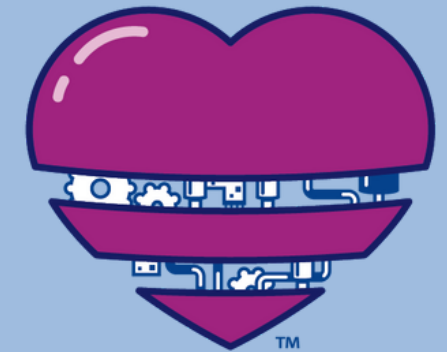
“Girl Powered” means both **making** and **seeking opportunities** as women in **STEM** and being **brave** enough to seize those lucky chances to **take initiative**.



Like shooting a disk, our team aims to take opportunities.

SETTING THE PRELOADS

Before the school's robotic season even started, Amelia, Nicole, and Yoyo decided to get an early start on learning CAD and mechanics. Because everyone in the team was new to robotics, we wanted to take advantage of the resources provided to us and get the team ahead of the season. We saw the **opportunity** to learn more about STEM and **took initiative**.



By taking the **opportunity** to participate in robotics over the summer, we were able to join the robotics club early. So during the club fair, we participated in promoting VEX robotics. We were given the **chance** to introduce the program to girls and take them on a tour around our robotics lab. By sharing interesting robot designs, we recruited two new members: Sammie and Ki On.

In the past years, there has been a disparity between the number of girls and the number of boys in our school VEX program. This year, we decided to make more opportunities for women to participate in STEM and formed an all-girl team consisting of 5 members: Ki On, Yoyo, Amelia, Sammie, and Nicole – all new to VEX robotics. Though no one had experience working on robots in the past, we were all invigorated to learn and explore, eager to bring our passion for STEM to the field.

MEET OUR TEAM

Our team consists of five girl members. While we are all new to robotics, we all come with **different perspectives** and fresh ideas. When we work together, we challenge each other to create a better and improved robot design.

AMELIA WONG

She has knowledge in CAD and design and also is part of our drive team as the lead strategist. Interested in pursuing a career in STEM, she wanted to learn more about the field of engineering and see if that is what she wanted to do in the future.



KI ON DU

With knowledge of science and an interest in engineering, Ki On joined our team after learning about the program. She learned to code and helped with things such as calculating and programming wheel velocity.

NICOLE YANG

Wanting to seek more opportunities in STEM programs at school, she joined VEX because of her passions. She has previous experience with 3D modelling and design. On the team, she brings in CAD knowledge and performs as the main driver.



YOYO BAO

Inspired by the accomplishments of the VEX team last year, she saw the opportunity of joining a robotics team. Exploring her passions regarding engineering, she specializes in CAD and is our main designer. She is also part of the drive team, serving as our Navigator.

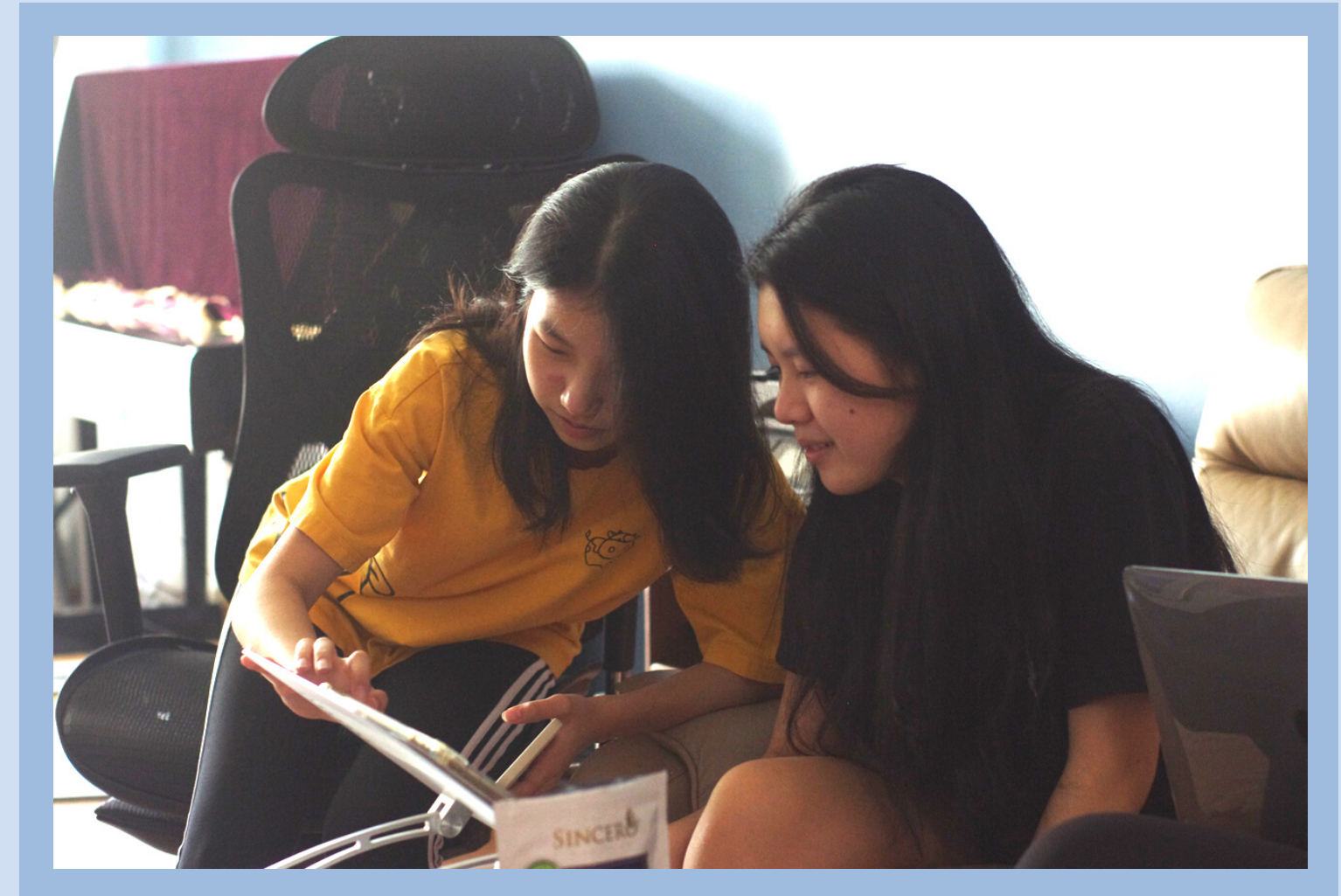


SAMMIE XIE

Carrying her interests in coding, she joined VEX to further explore her passion for programming. After learning more about the competition, she decided to serve as the main programmer on our team.

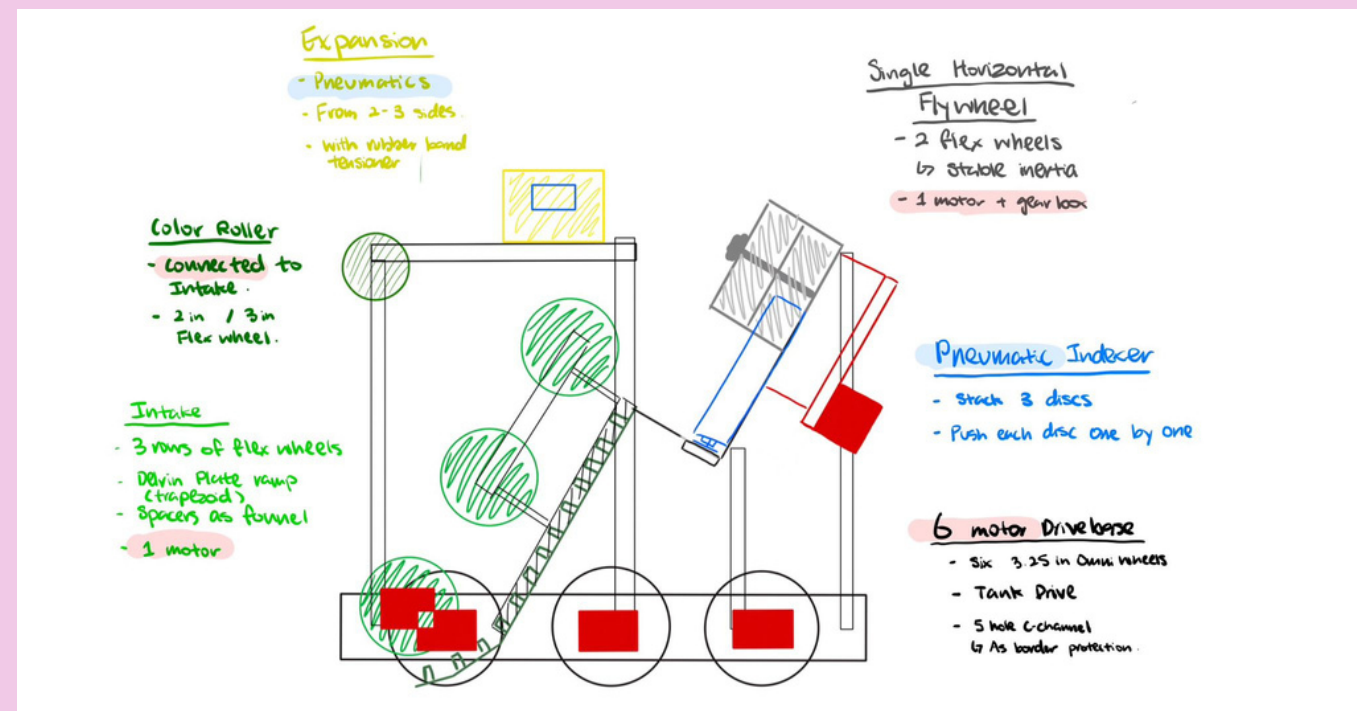
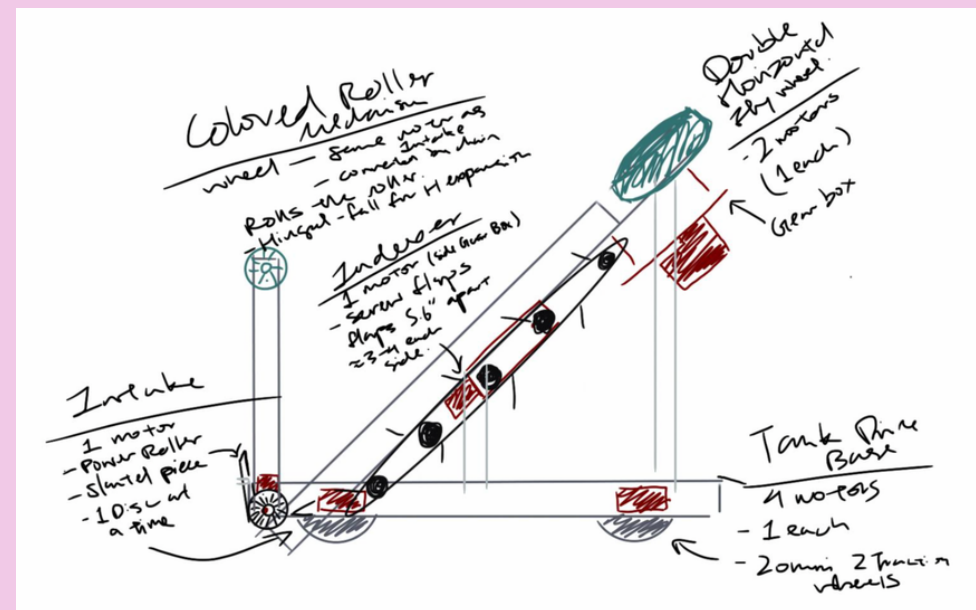
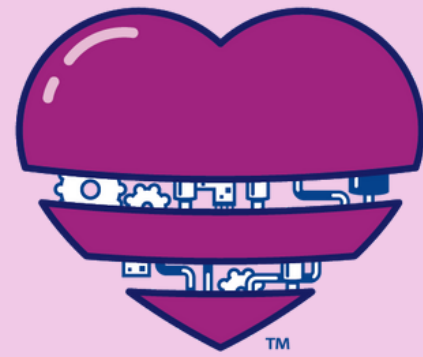
We divide the opportunities evenly throughout our team. Firstly, we came up with the design of the robot together. Then, our designers created a 3D model of our design on the computer. Next, we came together to build while the programmers work on the code of the robot. Finally, the drive team works together to lead driver practice before the competition.

Everyone is encouraged to try out different areas of robotics. We provide opportunities for each person to learn various roles. Even though she wasn't a coder, when given the opportunity to learn code, Yoyo learned some programming to help with the drive base code. This way, each person has the chance to learn and explore new areas of STEM.



By giving everyone the opportunity to take part in all the different sides of robotics, we didn't let our lack of previous experience determine what our team can learn now. Having the opportunity to see different parts of VEX helped us collaborate and put our skills together to strategize better.

In our group, everyone brings a different set of skills and perspectives to the field. During our team meetings, we take into account everyone's viewpoints by making sure each person has their opinion heard. We value each other's ideas and take them into consideration equally, giving each person the opportunity to share their insights.



The diversity of perspectives in our team influences the design of our robot and how we work together as a team. We came up with two different iterations of our robot. Each person came up with their ideas separately. Then, we came together to share our individual ideas and come up with a design that considers each proposal. The differences in our viewpoints made these two designs distinct.

ANGLES OF SHOOTING



Another example of success is our team notebook. We worked together to write entries that represented the broad range of viewpoints each team member had. The notebook was also diligently filled out with our reflections.

Our ability to succeed heavily relied on our diverse perspectives –seen in our participation in the Singapore Scrimmage. Our optimistic and open mindsets allowed us to communicate with teams from other schools. We were open to different strategies and discussed game plans each round. During the first day of the competition, we got onto the top three of the leaderboard.

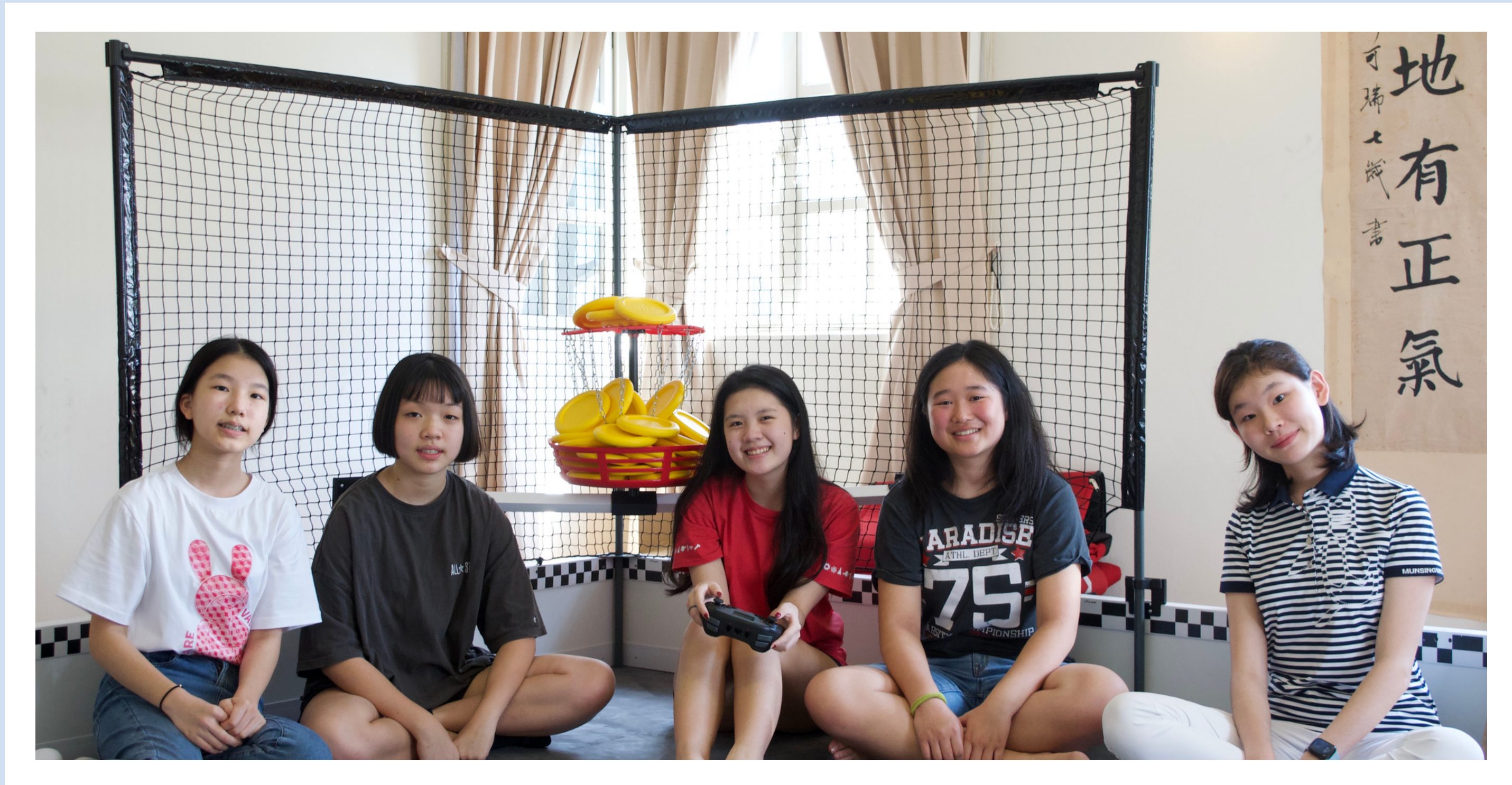
When we come across conflicts, we work things out by having meaningful conversations. For example, we had to work out who would take the role of the driver of our team. Rather than arguing, our diverse perspectives allowed us to take advantage of Nicole's prior experience in driving robots and let Amelia focus solely on strategizing for the games. In the end, we are able to consider everyone's expertise to combine our knowledge and build understanding in our team.





Over winter break, Nicole suggested that the team could bring the portable field to her house since she had a room empty. Because of this, we found the opportunity to transport the game field, allowing us to practice driving and work on the robot over break and put us ahead of the competition.

Even though we all have different things we specialize in, everyone works together to come up with designs and build the robot. We also try to help each other whenever we can. By including each other in our discussions, we let everyone have an equal opportunity to learn and improve.



Our team also values **providing opportunities for not only ourselves but others** in robotics as well.

Our team members both taught and participated in The Girl Powered Workshop. Specifically, we taught CAD on Fusion 360 where the girls learned the intricacies of 3D designing. This allowed more girls to explore the STEM field with other passionate female members, giving them **opportunities to learn** about engineering in a **community** they could feel **safe and comfortable**.

We also taught driving to give more girls the **opportunity** to drive. We decided to advocate for more female drivers because, during our competition, we noticed a lot fewer female drivers compared to male drivers. By teaching more girls to drive, we help **diversify** the robotics community.

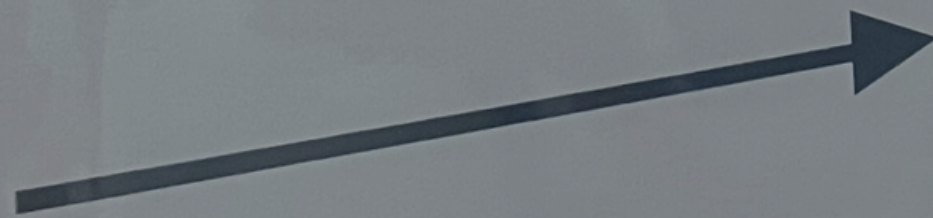
As a team, we have scored opportunities for more girls in STEM. Helping host the Girl Powered Workshop gave girls in our school the chance to engage in robotics and let girls of any age discover their passions in STEM.



SHOOTING THE DISCS



Career Paths @ Google
2 NOV | 10 AM - 12 PM



We also helped with teaching at a Google robotics event, providing an opportunity for people on the autism spectrum to explore engineering and coding.

SPINNING THE ROLLERS

After her husband's death, Martha Coston happened to find the notes he had written on night signalling. Seeing the **opportunity**, Coston decided to develop a signalling system based on those notes. Even with limited knowledge in chemistry, she was **brave enough to take the step forward**, developing the Coston flare in 1859, a device for signalling that the Navy still uses to this day. Coston utilized the **opportunities** she came across, making a big impact on the world today. Her bravery represents exactly what our team aspires to be. Coston took a big risk working in a heavily male-dominated field. She empowers women to show their ingenuity in underrepresented fields and **tells us to be unafraid to pursue the opportunities we come across**, even if there are risks and uncertainties.



An illustration of five young women standing in a line, smiling and interacting. The woman on the far left has her arm around the woman next to her. The woman in the center has her arm around the woman to her right. The woman on the far right has her arm around the woman next to her. The woman in the second from the right is making a peace sign with her right hand. The background is a solid light purple color.

Moving forward, we want to continue to search for and provide opportunities to girls in STEM – especially robotics.

We aspire to set the path for people after us and also ensure our own team continues to thrive in STEM, unafraid to continue to explore our interests.

SOURCES USED

- <https://alchetron.com/Martha-Coston>.
- <https://lemelson.mit.edu/resources/martha-coston>.