

Girl Powered

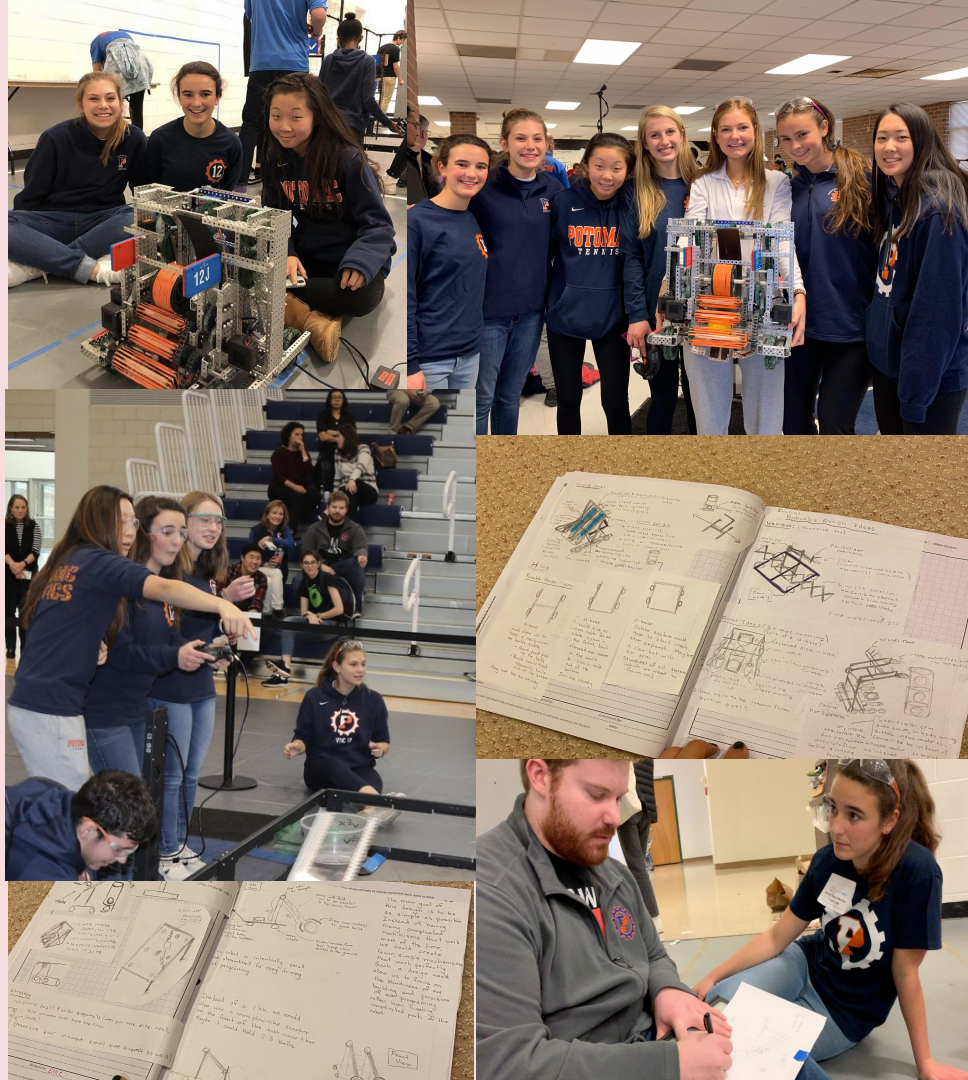
12M- Potomac School Robotics
Margaret Taylor, Rachel Miller,
Ellie Yoon, Kylie Fischer



Our Team

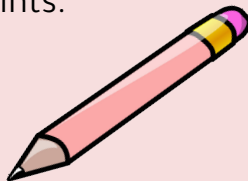


Our team first started working together at the beginning of last season in 2019. We all came from different teams with senior mentors and leaders so coming together as an all sophomore team was an adjustment because we had to figure out how to use our past experiences in robotics to help us build a successful robot. The engineering notebook was a fundamental part to our development as a team as the notebook encouraged us to think of building the robot using the engineering design process to put all of our ideas in one place. Any time we had an issue with our robot, we went back to the notebook and analyzed our old designs to figure out how we could improve our new design. We all would sketch different ideas out in the notebook so that we could take the best aspects from each of our sketches to make the most significant improvement on our robot. Because this was our first time working without mentors on our team, we all took leadership and taught one another skills that we had acquired and by the end of the season last year, all of our team members were able to provide unique perspectives on what were the best next steps to take with our robot.

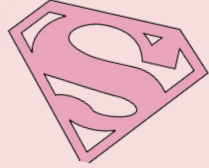


What “Girl Powered” Means to Us

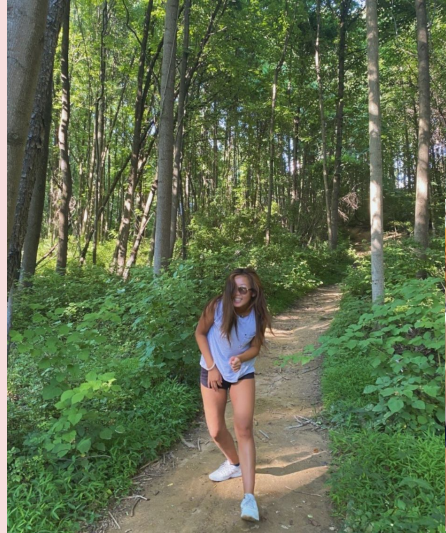
To us, “Girl Powered” means making **everyone**, regardless of their gender (or race, socioeconomic status, religion, ability, ect.) feel welcome and empowered in the STEM community. STEM fields are all about innovation and creativity, and what better way to promote new ideas than to collaborate with a diverse group of people with different areas of interest and knowledge? By drawing interdisciplinary connections between seemingly unconnected fields, we discover novel solutions to problems deemed unsolvable, and it is only possible to draw such connections if a team has diverse viewpoints.



Diversity of Interest



Our team comes from a wide variety of interests outside of robotics (including soccer, music, squash, math team, tennis, business club, and part-time jobs) which allows us to collaborate well together. Aside from simply making conversations more lively, our varied interests help us contribute different ideas to our robot, engineering journal, and online challenges. For example, one of our designs for our robot this year mimicked a tennis ball collector, and we can visualize our designs before building because of a teammate's artistic abilities. Because we value our diverse expertise in each aspect of the robotics process, we try not to assign specific tasks to each teammate. Rather, we all design and build the robot together, taking turns writing in our Engineering Design Journal. Then, we all learn how to program and drive our robot. Such a process has worked well for us because we each contribute different ideas and priorities in each stage. For example, when driving, some of us tend to prioritize offensive moves, while others focus on defense. Therefore, our strategies balance each other out, making our team stronger as a whole.



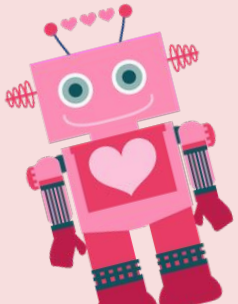
Science Kits for Second Story

One initiative we'd like to highlight is the initiative we recently took on amidst the pandemic as a team. We did not want a global pandemic to halt the learning and spread of STEM, so we sought to create science kits with materials, instructions, additional information and resources, and an outlet to receive help from us via email for children in the Safe Youth Project at Second Story. We created 100 science kits using leftovers materials from Fem N' Stem, found inexpensive resources, and budgeted to spend under \$150 dollars to provide 100 science kits which included chemistry, physics, math, computer science, and engineering experiments. We wrote instructions and a little lesson about each experiment in English and Spanish to make sure all of the kids could learn while having fun without a language barrier. Overall, we sought to reach out to kids in lower-rent communities to introduce them to STEM fields in hopes that they will be intrigued and passionate to grow up and pursue a career in the STEM field, lowering the disproportionate gap between historically marginalized communities and those which dominate the workplace.



Art Fest

Our team strives to share our passion for STEM and robotics with a number of different groups. For the past few years, our team has volunteered at the annual ArtFest in Mclean, VA with our school's robotics team to promote VEX robotics to the younger generation of both boys and girls. We teach them how to drive VEX IQ robots and the best strategies for doing so, how to construct toy cars that will roll faster or slower with weight, and structurally, what works best with VEX parts. All around, it's an event that promotes VEX to kids who have not yet experienced robotics before and attract the younger generation.



Fem 'n STEM

In addition, two of our team members, Kylie and Ellie co-head the club, Fem N' Stem, a club which strives to close the gap amongst women and men in the STEM Field. This year, the club has created content and conducted virtual science experiments with both younger girls and boys to get them intrigued and inspired to learn more about STEM. The club's also connected those 8 and 9 year olds with the upper school girls via zoom and a recently introduced mentorship program to address each child's questions and concerns on an individual basis. Last week, the club led an open-ended discussion about experiences women have faced in STEM amongst the upper schoolers and extended that conversation to the elementary students in our school to combat prejudices in their heads before they become engrained.



Outreach



Kylie also leads an organization called Girls Make Math where in the past, the organization has taught younger girls and gotten them excited about math; recently due to COVID-19, Girls make Math has been working to create virtual content to still promote it to younger girls.

Further, Margaret helps elementary-aged students at Second Story (a program supporting families experiencing financial hardship) with their math and science homework through a program called Game Changers. In addition to tutoring the students, she helps the kids complete fun, science-based activities.

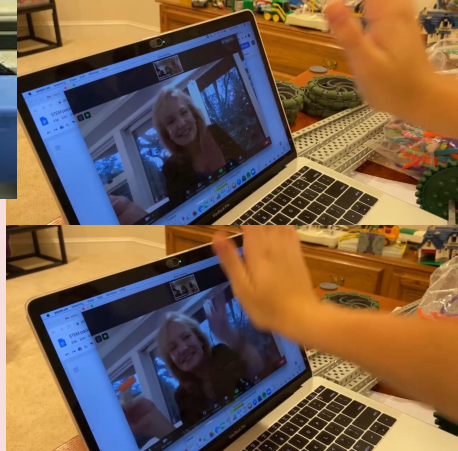
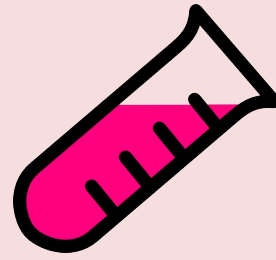
Rachel also is a volunteer math and science tutor for an organization called Intutorly, which is an program that connects students who due to the pandemic don't have access to all the resources that they would normally get in school with tutors.

Some of us also help younger students at our school with their math and science homework through a tutoring program at the Math and Science Collaboration Center.



Role Model

Our role model is Ms. Jarrett, one of our coaches and mentors. Ms. Jarrett worked as an engineer for Texas Instruments and has recently gone back to school to get her PhD. Ms. Jarrett not only encourages us to pursue robotics and STEM in our competitive high school as the only all girls team, but she also supports our efforts to inspire younger girls to pursue STEM. Ms. Jarrett is our teacher sponsor for the club Fem n' STEM that Ellie and Kylie lead working with younger girls in our community to discuss what it means to be a female in STEM as well as do engaging science experiments with them. Ms. Jarrett constantly supports our ideas and initiatives with enthusiasm and reaffirms the importance of our goal to motivate girls to pursue STEM.



Credits- Team 12M

Potomac School Robotics

Margaret Taylor- driver, builder

Rachel Miller- notebook, scouter, builder

Ellie Yoon- driver, programmer

Kylie Fischer- programmer, builder



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