

Girl Powered Challenge

12B - Potomac School Robotics



The phrase “girl-powered” exactly defines our mindset towards robotics and STEM: we are empowered because we are girls, and nothing can hold us back. Last year, we created an all-girls team, and most of us started off quite lost. Although a few members had participated in robotics years past, their team dynamics often consisted of boys who took control of building the robot and dismissed the other members. Because of these past team dynamics and our love for STEM, we all wanted a fresh start and to learn through experience.

Even though we had to rebuild our robot twice, teach ourselves how to code, and spend countless hours practicing driver’s control, it was all worth it. After a season of ups and downs, we had the opportunity to travel to nationals, defying all the previous doubts we once had at the beginning of our season. This year, we gained two new members: Jun-young and Kat Plaza who are both powerful assets to our team. Last year, we developed a foundation for robotics, and this year, along with the addition of our two adept members, we can now build upon it, innovating creatively and confronting all the challenges that come our way.





Olivia joined robotics because she loves STEM and hands-on learning. She joined her freshman year and immediately immersed herself in the Potomac Robotics program. She quickly discovered her adeptness for building, and has been refining this skill over the years. Her four-year VEX robotics experience has allowed her to speedily identify the aims of each game and how to build a robot best suited to accomplish those goals.

Kat joined robotics in sixth grade because she loved science and it seemed like a fun activity to do with her friends, but she has stayed for so many years because she has found that she loves solving problems. She views robotics as a series of problems and challenges to solve one after the other, which excites her. Kat spends her time on the team building the robot and managing the Engineering Notebook.



Charlotte joined robotics in high school because of her interest in STEM fields and desire to build. Using what she has learned in physics, geometry, and algebra, Charlotte builds the robot to maximize efficiency and precision, and helps plan the robot's different strategies. When she first began robotics, she was nervous to make significant design decisions and take risks. However, as new challenges have brought demands to redesign on the spot, Charlotte has begun to take more risks, growing her confidence and ability to lead without hesitation as one of the captains.

Jun-Young Hong is one of our most experienced teammates and one of our team captains. When she first joined 12B, she had to adapt to our team dynamic. She quickly found her place as an essential designer, strategist, programmer, and friend; she brings a fresh perspective and positive attitude to the room. Because of the strategy required in "Tower Takeover," she has lent many patient hours programming the most tactical autonomous.



Katherine Pommerening joined robotics sophomore year because of her love of both STEM and problem-solving. She had the opportunity to build, strategize and program and found that her skillset is best suited to building and strategic planning. When she began robotics, she was intimidated by the more experienced teammates around her and was not confident in her decisions. Now, backed by years of building, tinkering, strategy, and programming alongside a rigorous STEM-based curriculum, she feels confident solving any problem that comes her way.

Our team is filled with five different and vibrant personalities. Because of this, we are able to collaborate and innovate with five unique opinions. Being part of an all-girls team is so refreshing because we don't have to worry about being underestimated by our teammates or facing subtle sexism like all of our members have experienced in the past.

What We've Done

Children's Science Center



Olivia, Katherine, and Kat all have volunteered with the Children's Science Center. Olivia worked in the summer camp program to show children the numerous exciting possibilities in STEM and teach them how to work through the engineering design process with simple activities. Kat is on the Youth Advisory Board of the Children's Science Center and has been vice-chair for the past two years. She helps plan events, such as organizing a community program on zoology, and advises the Executive Board. Katherine participated in a lab internship during which she facilitated experiments, led field trips, cared for the wildlife housed in the center, and pioneered a new exhibit that remains in the Children's Science Center today called "It's All Relative." This fall, she created a program to donate robotics parts from her high school to CSC so more kids can gain access to robotics resources and exhibits from a young age.



Fem 'n STEM

Jun-Young is the leader of Fem 'n STEM, a club at our school that works with middle school girls with the goal to instill their genuine interests and nurture their intellect through fun science experiments and female guest speakers. Some past experiments include building paper rockets and making color changing slime, and we've had Ms. Erin Joe, the Cybersecurity FBI director, come and speak to us. We aspire to provide an environment of encouragement, without the fear of failure or discrimination in hopes that their confidence will continue to grow and that they never stop pursuing what they want—whether it be in the STEM field or not.



What We've Done (Cont.)

SERC



Katherine and Kat both decided to apply for Potomac's Science and Engineering Research Curriculum at the end of freshman year to explore science topics through accelerated courses and conduct hands-on research before senior year. Throughout sophomore and junior year, they received lab exposure on a trip to MIT, took multiple research-based courses to fuel their project creation, and took rigorous STEM course loads to build up strong skills in math, science, and problem-solving. Kat's project uses 3-D modeling to quantify the effects of microplastic on coral health, and she was recently chosen as a Regeneron Scholar for her research. Katherine's research project examines the bioremediation of a variety of industrial plastics using four types of fungi.

All members on 12B consistently volunteer with Artfest, an event in our local community with a variety of mini galleries featuring artistic work. This event features live music, art, and STEAM experiences for children. Throughout high school, all members worked in the Potomac Robotics booth. Every year, Potomac provides an exhibit with VEX IQ parts so children can build, experiment, and test their own robot designs. There are also other art-based physics activities that vary year-to-year. As volunteers, we get the opportunity to mentor these kids interested in STEAM by designing with them, helping them test, and encouraging their creative, young minds.

Artfest



MSCC

Olivia, Charlotte, Katherine, and Jun-Young are all tutors at the Math and Science Collaboration Center (MSCC) at school. Between the four of them, they tutor chemistry, precalculus, BC calculus, physics, algebra II, geometry, and biology. They all applied to be tutors because of their interest in STEM as well as their desire to give back to their community. In MSCC, tutors help explain difficult concepts and help guide underclassmen through different problems. They give advice and tips to underclassmen, but also ensure that each student reaches the conclusion or answer on their own in order to make certain that the student truly understands. Overall, MSCC is a great opportunity for our team to excite younger students about different STEM fields and motivate their problem-solving mind.

Our Role Model

During all of our time in robotics, we have all consistently turned to our coach and mentor Mary Muldowney Jarratt as a role model. Ms. Jarratt has worked at Texas Instruments as a high ranking engineer and she is always willing to offer us advice and wisdom from her experience as we navigate the choppy waters of being a woman in engineering. We are all extremely grateful to her for everything she has done, dedicating her time and energy to help us whenever possible. She is a great example of a woman in STEM and we all strive to be like her someday.



A "Girl-Powered" Team

Each person on our team has made a commitment to robotics because we love the team atmosphere, the problem-solving, and the way that it encourages us to apply our knowledge of and passion for science. It has led us to expand our love of STEM into service projects that help our community excel in and find their love of science as well. Being part of an all-girls team is empowering, and we love showing our capabilities to those who underestimate us. We know that the skills and self-advocacy we have learned in robotics will translate into the rest of our lives.

Credits

Team 12B

Olivia Lyall

Kat Plaza

Charlotte Ellis

Jun-Young Hong

Katherine Pommerening

Five

"Girls Run the World"