

Denver, CO

3946S

Women

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I first stumbled into the robotics lab on a rainy Thursday, my friend Keira grabbing me by the wrist and yanking me inside. It took only a second for me to realize that we were the only girls in the room. Already intimidated by entering a new space, I was dismayed at the stereotype coming to life before my eyes: a STEM-centered club full of teenage boys who seemed identical at the surface level.

Within a few days of being in the club, each lab visit less hesitant than the last, I was relieved to learn that Keira and I weren't the only girls. However, there were just two others who were students, and the four of us were vastly outnumbered by the twenty-something boys. Despite those initial reservations, we quickly fell in love with every part of robotics and the design process, from the creative sketches and brainstorming to the detail-oriented methodical programming.

Over the course of our sophomore year, Keira and I became more entrenched in the community and club. The learning curve was steep: we learned the proper way to use bearing flats after sabotaging a subsystem, the intricacies of code after deleting a key file, and the strength of power tools after mauling a c-channel or two. But with us the whole way was Ms. Hellman, our role model and mentor, and the head coach of our school's robotics club.

A former member of a high school robotics team herself, Ms. Hellman has a personal understanding of the inherent challenges that women in STEM face. Her experience on a high school team was startlingly similar to ours: being outnumbered and ignored in a sea of men. For us, actually witnessing a woman in a position of leadership within engineering is worth far more than hearing a hundred stories about one. Talented and passionate, Ms. Hellman's made an incredible impact on the club and has earned the respect of students who were initially wary of a female coach. She provides insightful comments about physical work and team relationships and stands up to disrespectful comments. Additionally, she creates a more inclusive environment by the way she treats club members: no one's identity is held against them or for them, we're all just high schoolers in robotics. Her mindset is the reason Keira and I continued in the club despite adversity.



At the beginning of our junior year, Keira and I became co-captains of our own team, something we found as exciting as it was nerve-wracking. We ran into the season with enthusiasm and we had big plans for ourselves, our team, and the club. Although we lacked some knowledge and experience, we were determined to learn and grow.



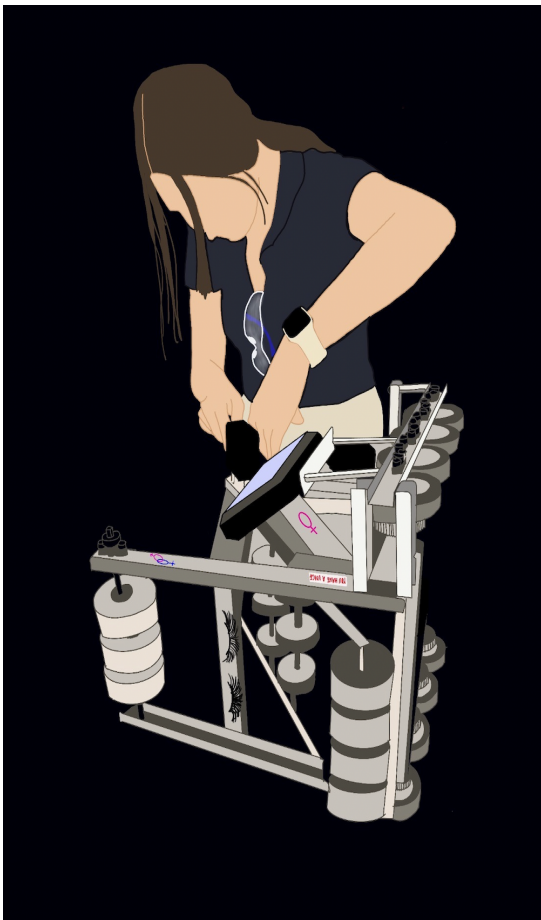
Unfortunately, we soon became targets for other club members who had previously just ignored us. Keira and I created the first women-run team, and in a space where a girl captain was rare to begin with, many were unhappy that there were two of us. As a result, we were subjected to insults and criticism, beyond just high school foolishness and turning into harassment from deep-rooted misogyny.

Until then, it had never once occurred to either of us that being female could stop us from achieving success like our male counterparts. But each day we were told that we were “tokens” and “nothing more than figureheads”, that “girls don’t belong in robotics” and we were “going to drag the club down”.

By wintertime, we began to dread going through the door, knowing we were walking targets in a lab of hunters. We’ve always been people that pour our hearts and souls into every activity we do, and it hurt to be devalued for just existing in a male-dominated space. Some days, all we wanted to do was quit, but we refused to let immature comments take us from an activity we love. We were determined to carve a space for ourselves and for other girls in the robotics lab.



We felt some temporary satisfaction when our team placed higher than theirs at our February home tournament, garnering, if not apologies, at least some grudging respect. Afterward, although the same snide remarks continued, they had lost their effect on us. With newfound confidence, we poured our time and energy into equalizing the space for girls interested in robotics. We stood on stage at assemblies in the spring, facing hundreds of pairs of eyes and bright stage lights to invite new club members and talk to underclassmen about my personal experience in the club. Our voices shook onstage, unbalanced by the nerves that came from speaking to hundreds of people at once. Yet that didn't change the power of our message. We encouraged girls that felt they weren't smart enough or were too scared to enter the toxic environment. We worked with Ms. Hellman to remake the previously 30-person club into a place that 28 girls signed up to join this year... 7 times the number that worked in the club last spring.



This robotics season, our club has 5 female captains, each talented and deserving. Keira and I have a third co-captain, Paloma Spahr, a sophomore who is brilliant and passionate about expanding our club's legacy. Our team has several girls, all of whom are deeply interested in robotics and STEM and feel comfortable coming to the lab, in a space where they're surrounded by other girls and are valued and wanted. Although a lot of our energy was targeted towards girls in particular, the club has become a more inclusive place even gender aside. The more people involved in robotics that don't fit the stereotype, the more people there are that feel encouraged to join and comfortable in that space.

As of this year, my little sister is on a middle school robotics team and is part of the first-ever competitive team composed solely of girls at our school. Our team takes time each day to mentor all middle schoolers, but we've created a special connection with this team, and they've told us that one day they'd be captains of their own teams in high school. We're building the future of robotics at our school.

Diversity of perspective is the key to a successful robotics team. Different ideas are what form a true team, and since we have members of different backgrounds, we're able to learn from each other. More viewpoints lead to faster and more impactful problem-solving. Each member of the team has a different skill set and something they can teach others: Clay has an eye for spotting issues, Anika is talented with designing systems on the fly, Chuck can problem-solve his way through any build issue, and Hadley comes up with innovative ideas that the rest of us would never have thought of.

Every member of our team works together on each facet of the robot, as something Keira,



Paloma and I have prioritized is ensuring each member learns every part of the design process. From CAD to code, and building to testing, the design cycle is a team effort, and our members contribute valuable feedback each step of the way. Although it's natural for members to gravitate towards certain specialties, every member is required to at least learn the basics of each part of the design process. For some, that's meant stepping out of their comfort zone, but it's resulted in so much growth. Paloma's been an incredible co-captain, and this season she's become a confident public speaker and

an assertive leader, when she previously struggled with social anxiety, particularly around speaking. Cam and Quinn have found a love for programming that they never expected, and although hesitant at first, they're now two of the lead coders on our team. So many skills in robotics can be translated into other areas of our daily lives, and our team has learned many valuable technical engineering skills like machining and programming, alongside many softer skills in the vein of problem-solving, presenting, and collaboration.

To us, Girl Powered means quite literally being backed by girls. Our robot was designed by girls, built by girls, programmed by girls, and decorated by girls. It means that I can walk into a tournament with makeup and a bow in my hair, and still earn respect because of our team's performance. It means that our robot can meet every challenge, but still look good doing so with fake eyelashes and stickers. It means that instead of encouraging assimilation and hiding the things that make us different, we fight against it. Our Girl Powered team has silenced the criticism that forced us to cower, and instead embraces the difference in perspective and skills that we can bring.

Today, a sunny Thursday, I walked confidently into the robotics lab to join Keira and Paloma already at our table. I smiled at Zoey and Lilly, captains of another team, and greeted Anika, Cam, Chuck, Alyssa, Charlie, Eli, Kate, Quinn, Xavier, Xanthe, Aidan, Hadley, Clay, Anika, Holden, and Alexandria.

