

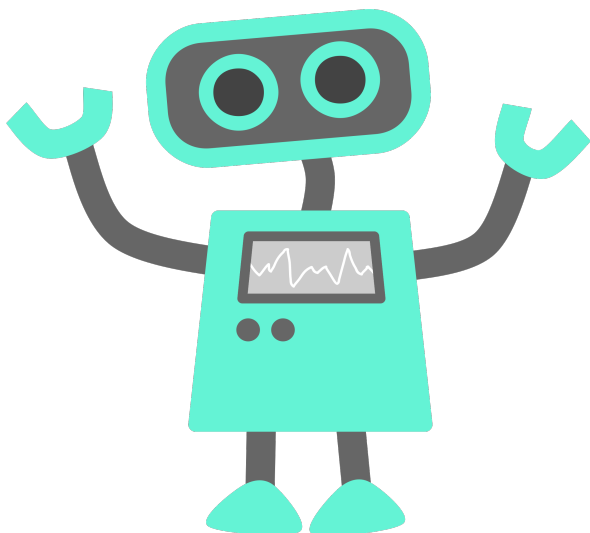
While talking about the low number of women in STEM fields, many people do not stop to consider the real-life repercussions it has, beyond those easily-forgotten digits on a paper or computer screen. As women who are involved in the robotics team and regularly go to competition, we are constantly reminded of the reality of those numbers—they are our day-to-day reality, the daily grind, as one could say. They are felt in the eye rolls between us girls over the ever-present macho posturing before and after matches, the sighs we let out at the juvenile horseplay in the pits, the defensiveness we take up at any hint of provocation when scouting. Those numbers were most certainly present the day we walked into the robotics classroom on the first day of our freshman year—there were seventeen boys and three girls; we were overwhelmingly outnumbered. The class was a cesspool of toxic masculinity-- a natural result of stuffing some of the worst examples of stereotypical misogynists in STEM fields into one classroom together.

The three of us who had joined the class were intimidated, of course, but there wasn't a chance on Earth that we would let that stop us. If anything, it just motivated us. We weren't going to let a couple taunts about our done-up hair or cracks at our emotional-- and mental-- stability crush our high hopes. And we

Girl Powered

vowed that over the next four years we would show them that we were there to win. We weren't scared of broken nails, hard work, or high stress environments. We were ready to prove that anything boys can do, girls can do better.

When it seems like the whole world is against you succeeding--in this case, the world being our peers--the future can seem a bit bleak. But we were not just objects of fate's whims; we wanted to fight. We wanted to win. It didn't matter that our peers often thought themselves superior, because we knew that we wanted it more than them. Almost every day, we would show up an hour early to school and stayed more than an hour late after school to work on whatever robot we were building, or even just to work on various projects that we were experimenting with at the time. We showed up to every competition and scouted for our team; we did our best to learn from every single team that showed up to the competition: what to do, and more importantly, what not to do. We learned about as many builds and designs as we could, and what worked about each one, because we knew that we were the future of the team.

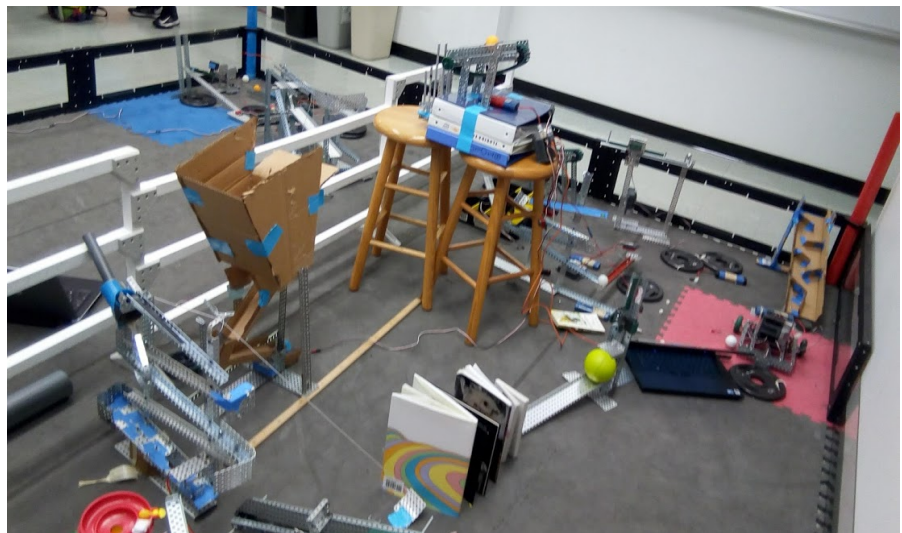


There were three of us, when we first started the class: Kaiana, Ronnie, and Shornam. We all had a basic background in code from various classes or workshops or summer programs, and we managed to convince our teacher to put us on a team

together. For about the first half of the year, we traded off jobs and we rotated through being designer, builder, and programmer, as well as driver. Eventually, we settled into a comfortable pattern, with Kaiana as main designer, Shornam as main builder, and Ronnie as main programmer, although we each did a bit of all three.

Comfortable, however, did not mean that it was entirely flawless. There were rebuilds, as we learned and relearned what would make every bot function as it should.

One of our projects was a mini-Rube Goldberg, and it took almost an entire month as we made it, watched it fail, and then went straight back to the drawing



board to come up with a better idea. Eventually, however, we succeeded. Our Rube Goldberg consisted of a ping pong ball that was carried down a conveyor belt and placed into a launcher, which sent it into a funnel. The ball ran down a switchback leading from the funnel to a light sensor that triggered a



rack gear. The rack gear moved up, releasing a Nothing But Net Vex ball, which then rolled down to knock over a domino of books. Soon, we managed to get it to work a consistent ten out of ten times.

When we first joined robotics, we were the only girls in the class. Then we realized we were the only girls on the entire school-wide team. So by the time

we got to our first competition, we were unsurprised to find that the three of us made up a significant fraction of the girls who were there. Not that this is strange to girls growing up focused on STEM fields, not after coding classes made up of all boys, or science magazines with few mentions of any women, or history books that forget that women deserve a voice for their achievements, too. Because although many of our textbooks would prefer to ignore it, many of humanity's important discoveries were made by women, and especially in more modern times, by teams including women on them. And every year, more



people realize the benefits of them. Teams with more diversity do better—there are different perspectives to bounce ideas off of, which leads to all sorts of interesting theories. With different people come different backgrounds, and many interesting people, making team bonding a fun and constant occurrence, improving team chemistry. This is how we know that diversity helps everyone, not just those that had been excluded before. By embracing these differences, we can make the whole team better.

It's never easy to try new things, to enter a new environment. It can feel like everyone is against us, that no one wants us there. Usually, it's just a feeling, but sometimes it's the reality. Integrating ourselves into the close-knit, all male, robotics team was difficult. We faced comments like “what is *she* doing here?” and “the team was better before these girls joined; we actually got work done.” The comments stung, because we knew that we were productive, contributing members of the team. However, we persisted, because we knew we could make it better, little by little. This path has been paved, and is being paved, by many brave, talented women. One such woman is Margaret Hamilton, who led a team to develop in-flight software and systems software for Apollo and Skylab at MIT. Her team almost singlehandedly saved the 1969 Apollo 11 lunar landing. She was an incredibly talented engineer, programmer, and entrepreneur, and she didn't let the restrictive views of her time slow her down. Women like her are

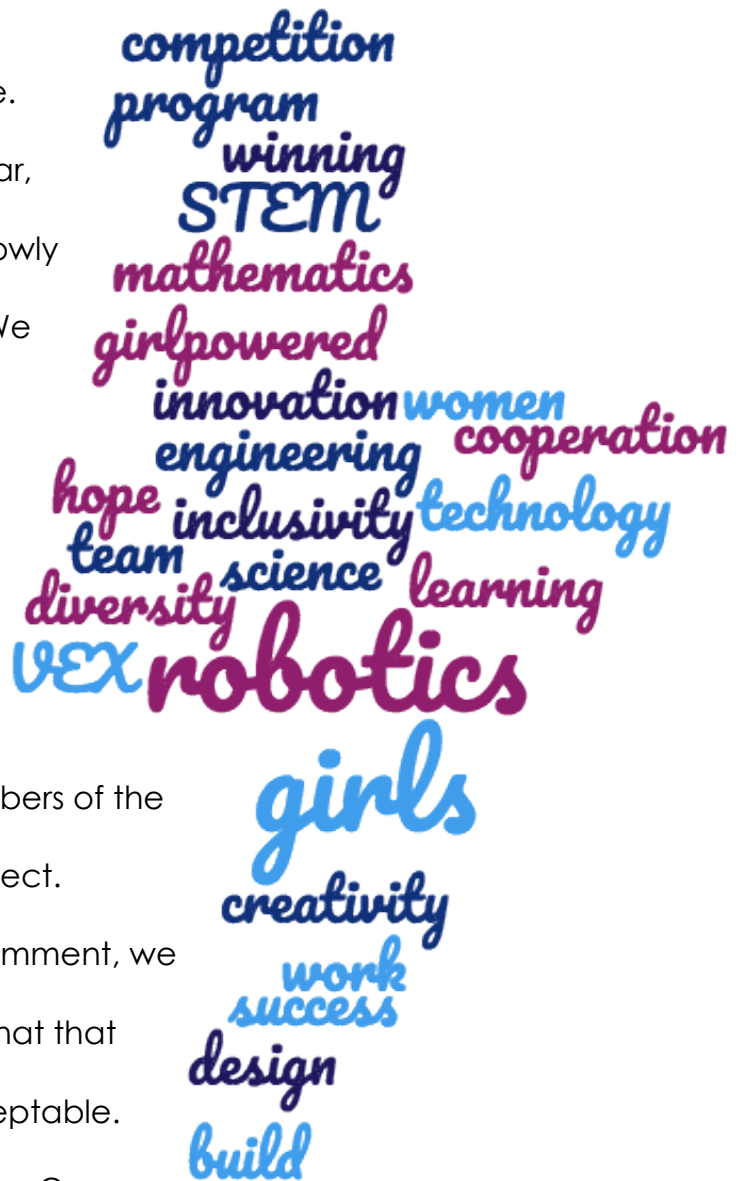
huge inspirations and fantastic role models—if they can do it, so could we. And we did. Throughout the entire year, as we worked on class projects, we slowly integrated ourselves onto the team. We sat in on team meetings and occasionally helped with the builds, always taking any chance we could to learn from the more experienced team members. We established

ourselves as intelligent, capable members of the team, and soon, we earned their respect.

Whenever someone made a sexist comment, we did our best to shut it down, to show that that kind of ignorance was no longer acceptable.

Now, a year later, the situation is better. Our

team is still mostly male, but now we have more female members working alongside them. Now we have respect from most of our male teammates. Now we have a next generation of girls, so the team won't fall back into its all-male exclusivity again. Now we are in a position to transform our team, and to us, that's what girl powered means. It means helping pave the way for women in STEM fields, one inclusive environment at a time. It means carving out a space





for women wherever we go,
turning that male dominated,
chauvinist team into a team that's
going to welcome a girl with as
much enthusiasm as they would a
boy. It means ignoring sexist
comments, and ignoring the boys
at the competition who think we
know much less about building
robots than they do. It means
succeeding.

Credits
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