

# 6106A CHOATE ROSEMARY HALL

NANDINI ERODULA AND ELISE HUMMEL

Girl⚡Powered





## THE BEGINNING

The Choate Robotics Team was established in 2013. During that first year, the team consisted of seven students, one advisor, and one robot, and was housed in a small janitorial closet in the Humanities Building. There was only one girl on the team.

We've grown since then. We've graduated from our janitorial closet to a new building, the Lanphier Center for Mathematics and Computer Science, where we have a state-of-the-art robotics lab. Our team consists of fifty-six students, two advisors, and eight robots.



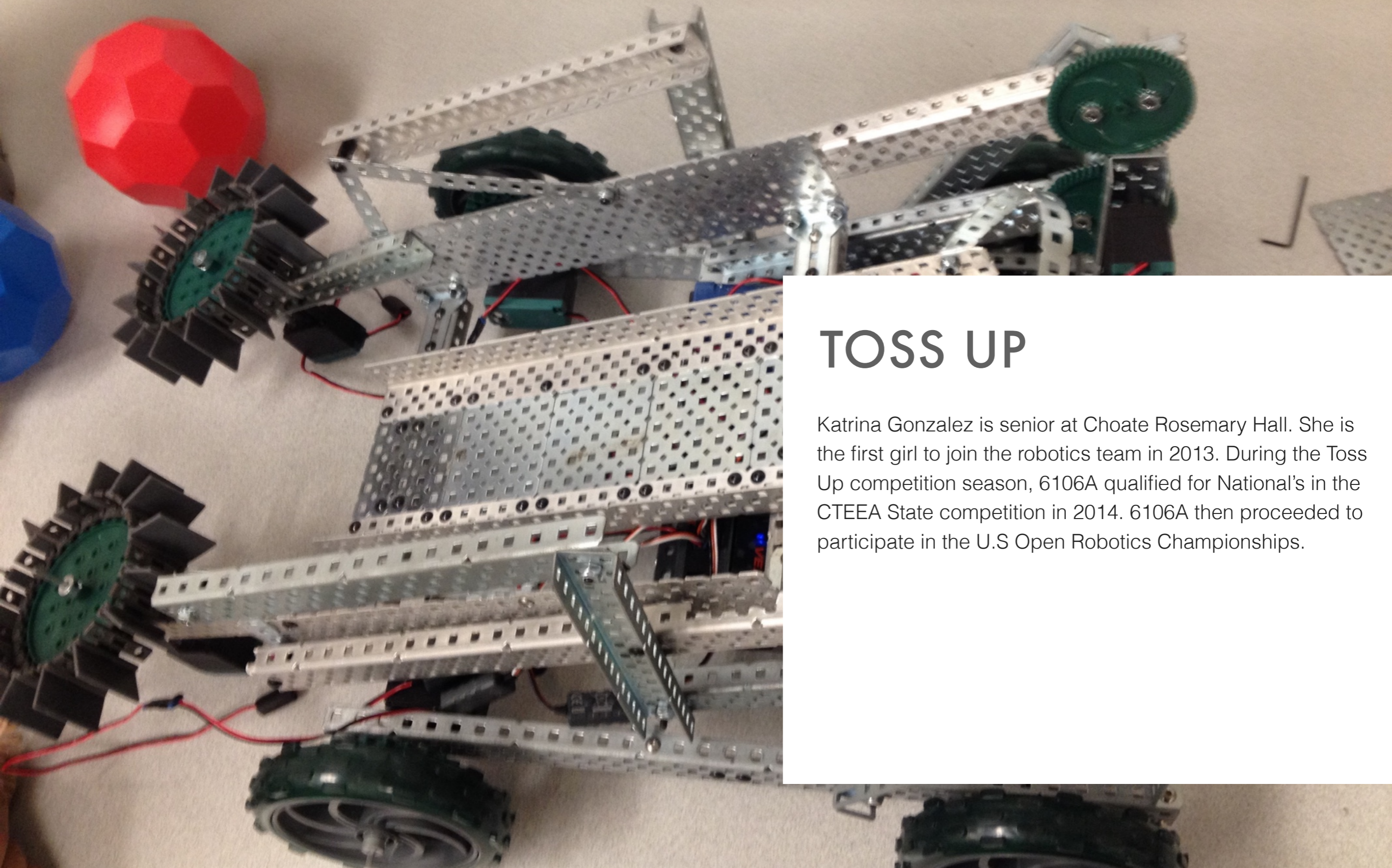


Of those students, fourteen are girls, representing 25% of the total members on the team. The lone girl during Year One is now our captain.

These changes didn't happen overnight. In the last three years, Choate Robotics has grown to be more competitive, more inclusive, and more representative of the female students at Choate Rosemary Hall.

Here's the story of the girls, Katrina, Elise, Nandini, and Irie, of 6106A.





## TOSS UP

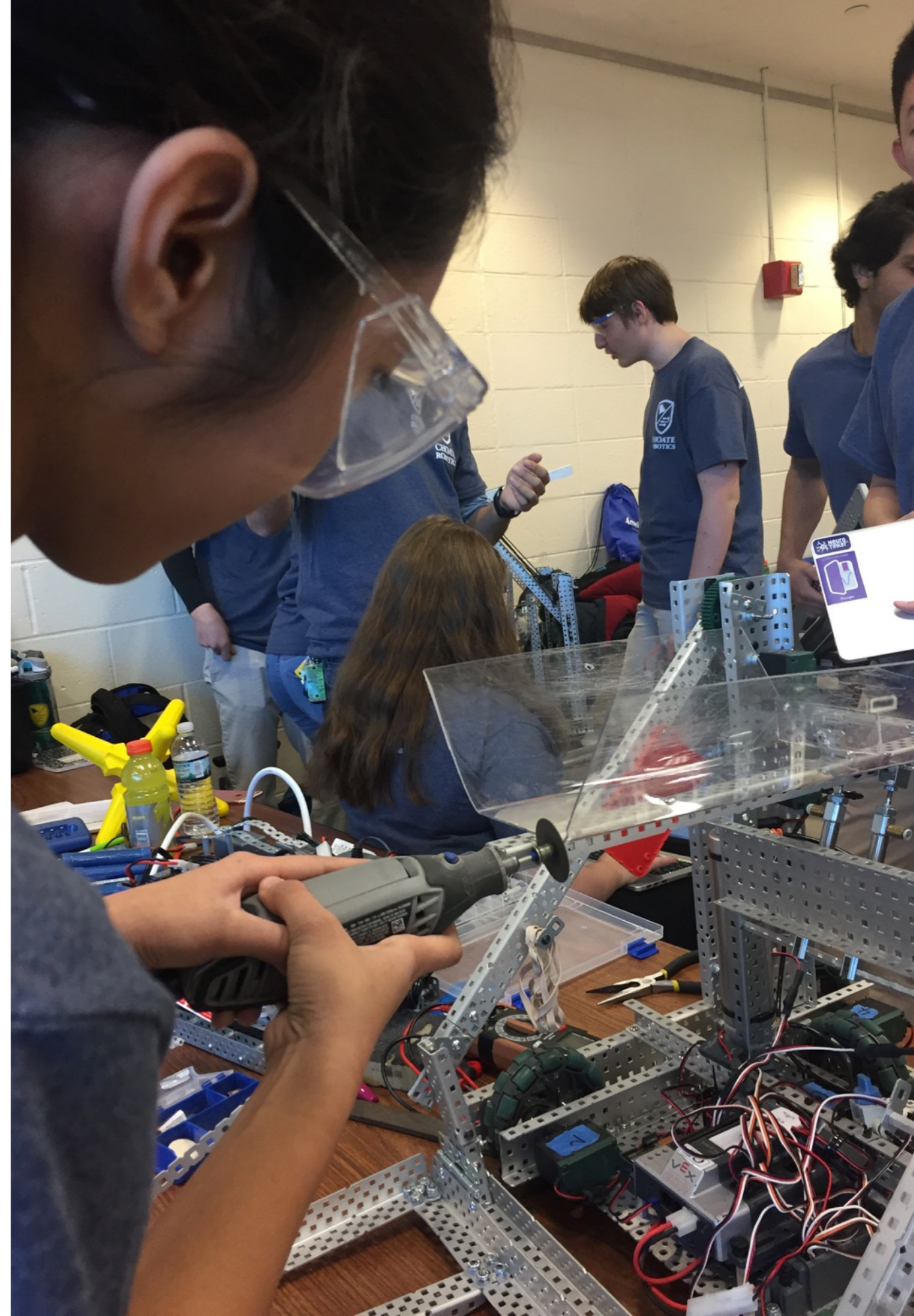
Katrina Gonzalez is senior at Choate Rosemary Hall. She is the first girl to join the robotics team in 2013. During the Toss Up competition season, 6106A qualified for National's in the CTEEA State competition in 2014. 6106A then proceeded to participate in the U.S Open Robotics Championships.



# KATRINA'S STORY

As I walked into the first robotics team meeting of the year, I glanced nervously around the room. Scanning, I took in the aluminum and the motor parts scattered across the table. I noticed the faint smell of lithium grease, of aluminum dust. It slowly dawned on me that I was the only girl out of the group of ten. Even after studying at a STEM magnet school, being the only girl in the room was a new experience; there had always at least been a female teacher to balance out the class. But there I was, surrounded by boys who all seemed to share a kinship I did not.

I didn't let the initial discomfort dissuade me though; I was back in that lab every Sunday. The captain would ask me to mirror a build and I would do so uncertainly, every step traced out cautiously. There were moments when I doubted myself, when I undercut my own competence because it seemed as if so little was expected of me. But as the weeks went on, I learned how to switch out a motor faster than any of the boys. During discussions, I could feel some of the boys doubt me as I explained my ideas; with each snicker or doubtful glance, they would inadvertently diminish the importance of what I said. I learned to calmly dismantle their arguments with specifics, to speak and to be heard. Though there were days when it seemed easier to remain silent than to assert myself, I don't regret making myself heard. The boys came to respect my opinions and my abilities, and I opened up to them in turn. Together we bonded over broken locks and stripped gears.



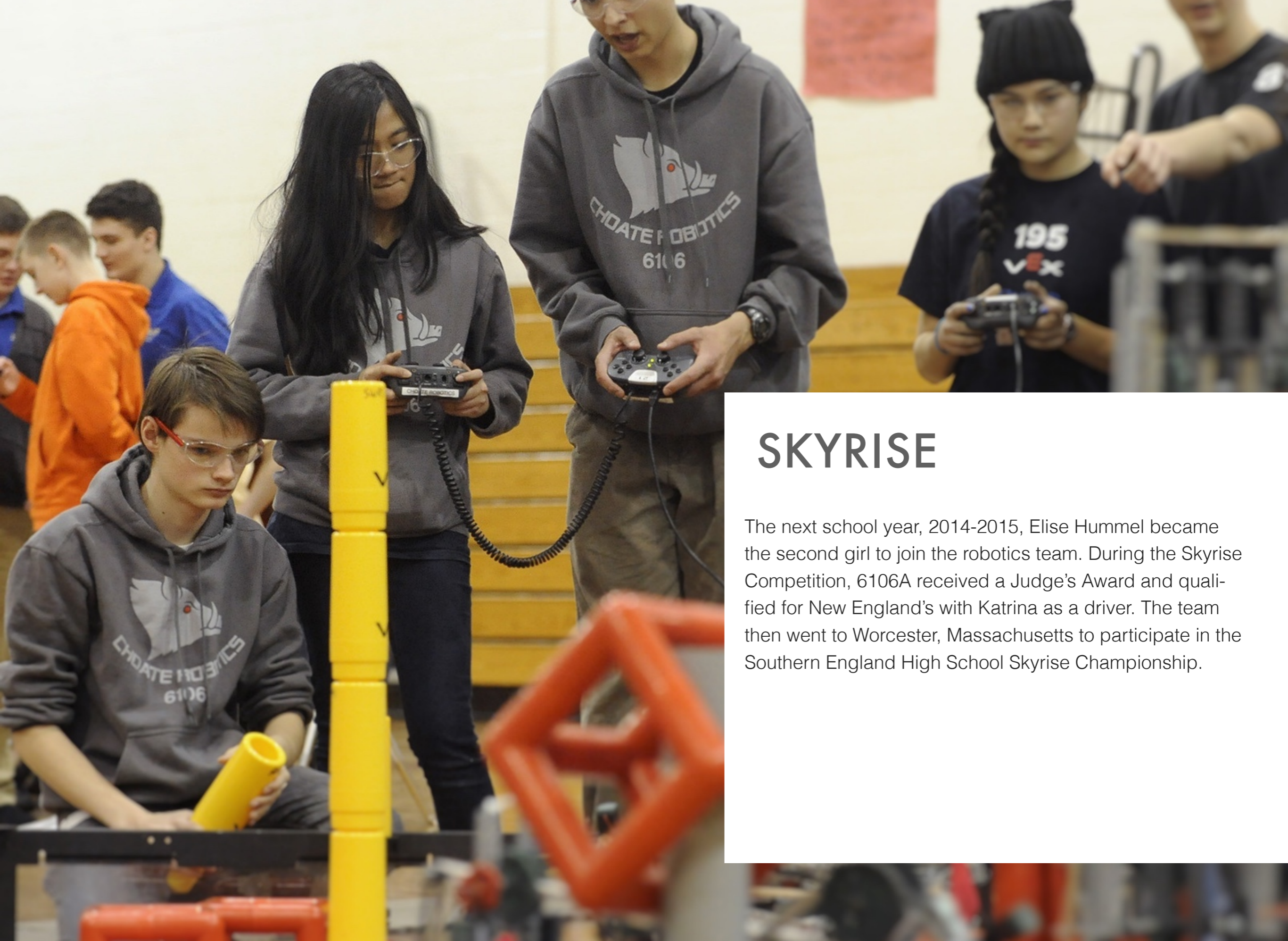




Now, I come back every Sunday with an ease born of experience and sit next to Annabelle, a girl who just joined the team. At the beginning of this year, before starting on our builds or designs, we looked towards growing the club and attracting new members. During Clubfair, as people filtered between booths, I heard Anjali, a new student, ask if there would be any other girls on the team. Four years ago, the answer would have been no. But this time, Max just smiled and pointed to me, saying, "Yeah, she's our captain." When I was a freshman, there were no other girls to look towards for support. Now, I want to not only be the girl that Anjali can look to for support, but to be the girl Annabelle can look up to for inspiration. Each Sunday, I see Annabelle in the lab and I can see the same drive, the same

passion that I had in myself four years ago. When the time comes, if she wants, then I hope she'll know that she can be captain without having to worry about how people would perceive her. I want her not to look at the captainship or robotics and see them as inaccessible, but to see only the pieces left over from a broken glass ceiling. I want to not only lead the team well for this coming year, but to create a legacy for her and the girls that come in the time after.

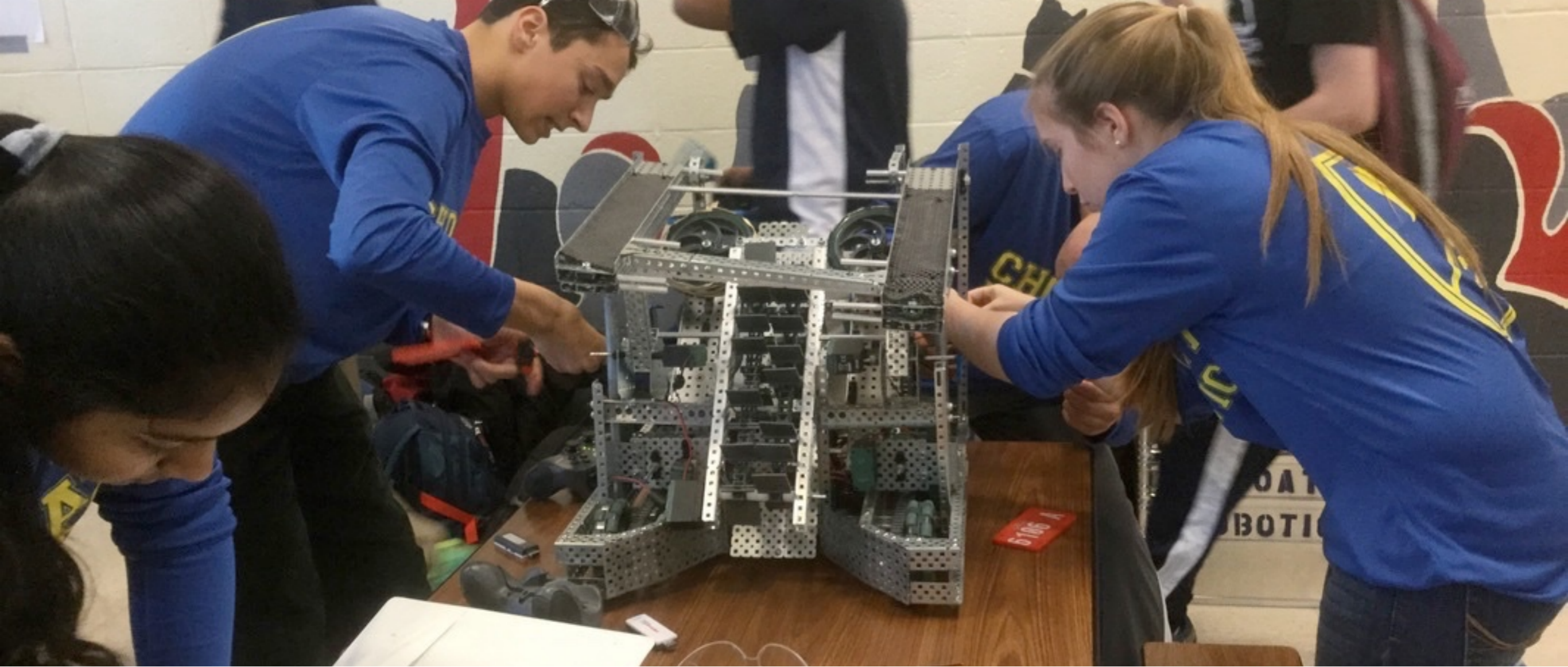




## SKYRISE

The next school year, 2014-2015, Elise Hummel became the second girl to join the robotics team. During the Skyrise Competition, 6106A received a Judge's Award and qualified for New England's with Katrina as a driver. The team then went to Worcester, Massachusetts to participate in the Southern England High School Skyrise Championship.





## ELISE'S STORY

I've always been interested in robotics. When I was younger I loved to build and invent things, and robotics seemed like a way to further that interest. I signed up to take an introductory course in robotics my freshman year, and although I wanted to sign up for the robotics team as well, I was scared. I didn't have any experience, so I was afraid that I'd look dumb and confirm in the boys' minds that girls aren't good at STEM. Eventually, though, I gathered up the courage and signed up for the team.

When I walked into the first meeting, I was surrounded by a large group of boys, They all seemed to know each other, and I was a clear outsider. I scanned the room until I pinpointed the only other girl in the room, and I quickly walked over to sit near her. When we split into groups to talk about designs, I followed that one other girl like her shadow, too nervous to be alone with robotics boys.

What I learned throughout that first year is that it's okay to speak up. Katrina took me under her wing, and through her example I learned that being a girl in a STEM club doesn't make you any less



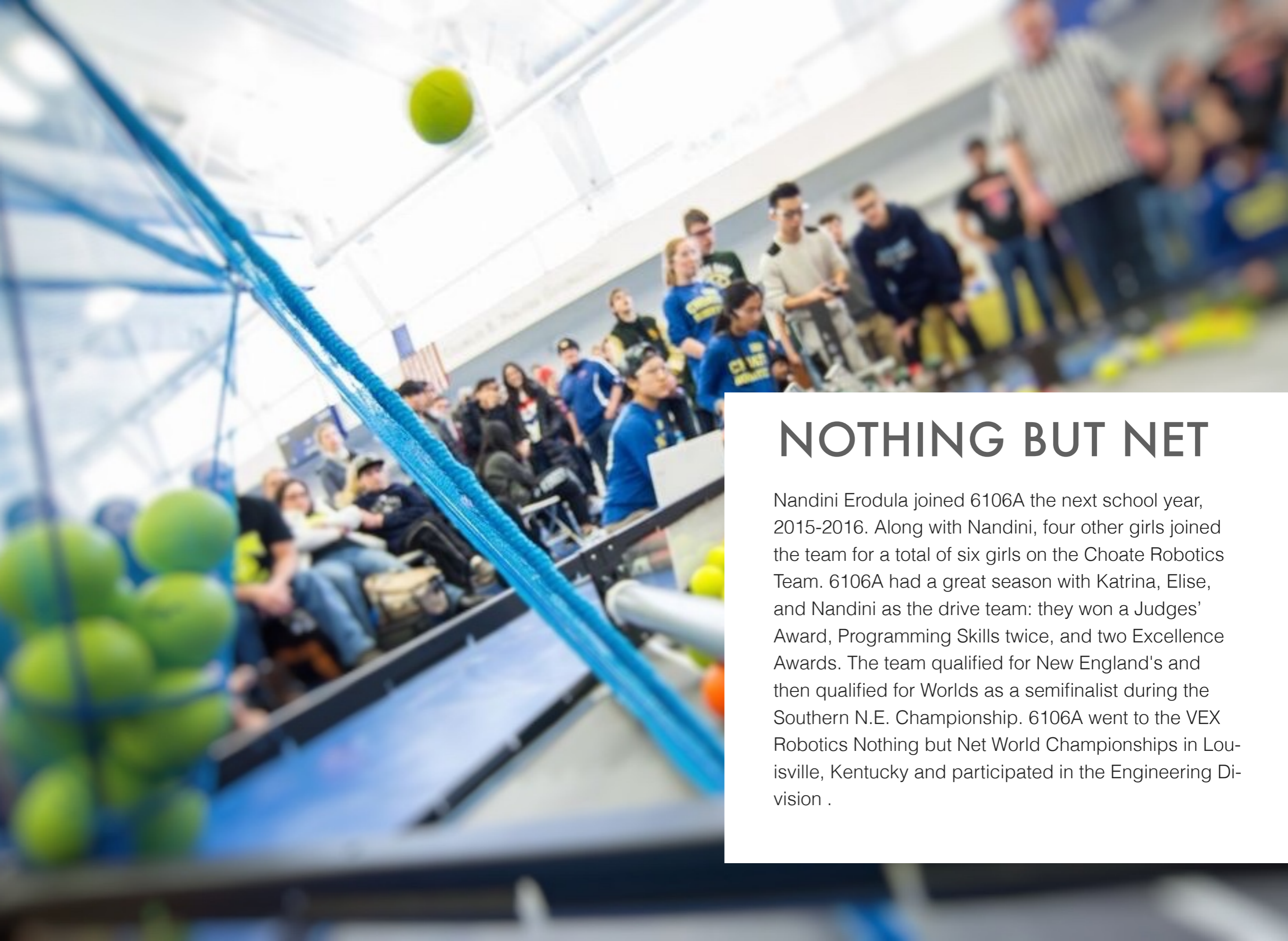
capable than anyone else; you just have to be assertive. I learned to speak up and share my ideas. That season my job at the competitions was making sure the batteries were fully charged and ready to go for our two robots, but I worked my way up from there. I was the driver for 6106A during the Nothing But Net, when we qualified for Worlds, and I'm on the drive team this year as well. I've made great friends, and I feel like a valuable member of the team.

However, as I become more involved in the competitions and interact more with the other teams, I've realized that I'm not viewed the same way as my male teammates by some other schools. I've realized that my face leads to certain assumptions about our robot--most commonly expressed when the boys we're allied with say, "Don't worry, we can take the cube." This year especially, I've learned to stand up for myself and my team. We've worked hard on making a competitive, capable robot, and we have been successful. Vex Competitions have taught me the important life skill of sticking up for myself and being an active participant. Throughout the past three years I've learned to step out of my comfort zone, defy expectations, and push against the boundaries of what I think I can do. It makes me proud to see more girls entering the team and pushing their own boundaries each year.

I hope that someday, a girl will be able to enter the robotics team without feeling nervous or out of place. I hope she'll be able to share her ideas without being afraid of looking stupid. I hope when she's scouting for alliance partners, she'll have to convince the other teams only of her robot's capabilities, and not her own. I hope that someday soon, successful Girl-Powered robots aren't out of the ordinary, because everyone recognizes the potential that girls have to excel in STEM fields.







## NOTHING BUT NET

Nandini Erodula joined 6106A the next school year, 2015-2016. Along with Nandini, four other girls joined the team for a total of six girls on the Choate Robotics Team. 6106A had a great season with Katrina, Elise, and Nandini as the drive team: they won a Judges' Award, Programming Skills twice, and two Excellence Awards. The team qualified for New England's and then qualified for Worlds as a semifinalist during the Southern N.E. Championship. 6106A went to the VEX Robotics Nothing but Net World Championships in Louisville, Kentucky and participated in the Engineering Division .

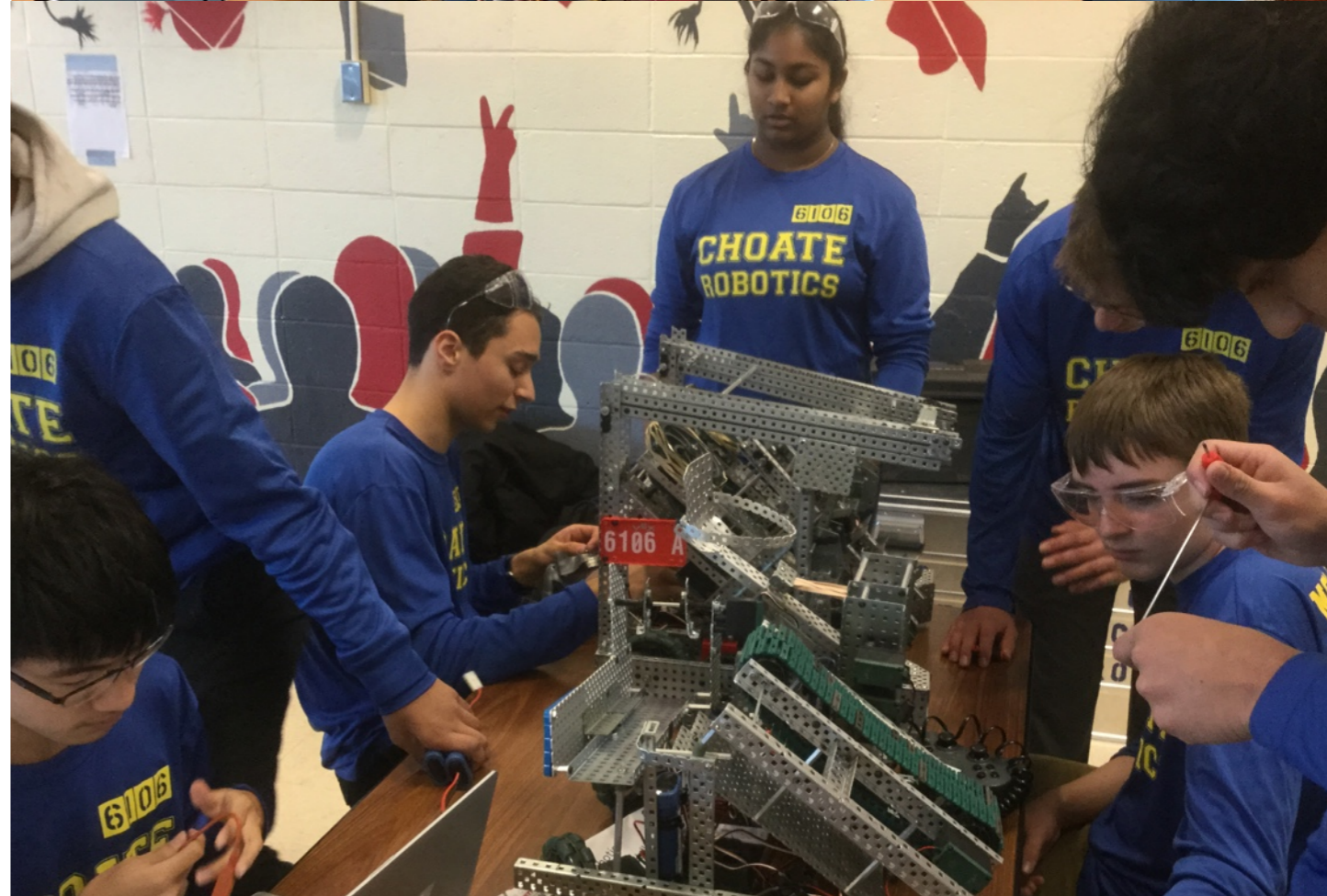
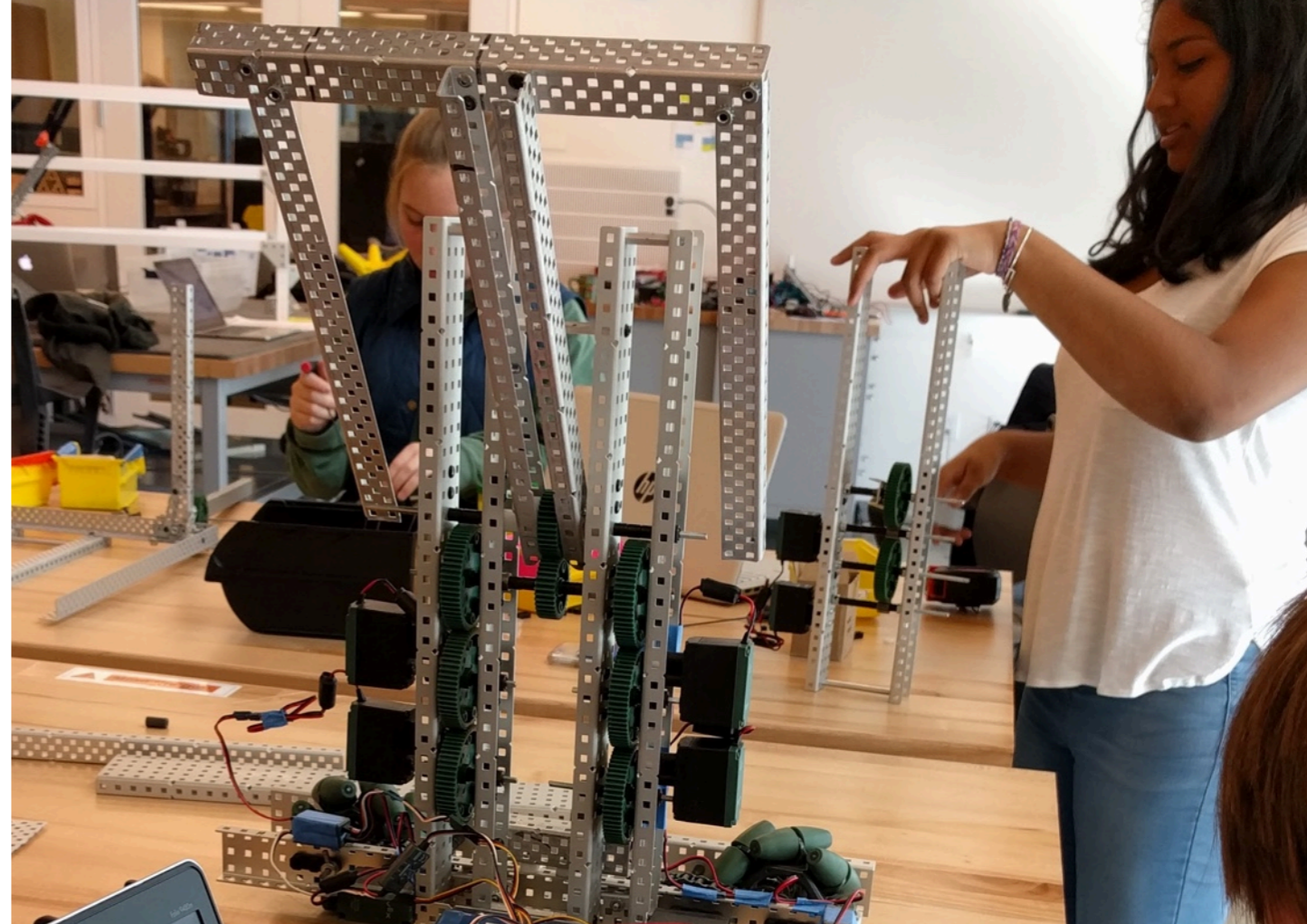


# NANDINI'S STORY

I had no prior robotics experience before high school, but I decided to try something new by taking the Intro to Robotics course my freshman year, in 2014, that was taught by one of our robotics team advisors, Mr. Murgio. I learned how to design and build robots, and I discovered the beauty of programming robots to interact with objects and their environments. I decided that I wanted to learn more about robotics, and I asked Mr. Murgio what I could do to further learn about robotics. He recommended that I join the school's robotics team next year, so I joined the team my sophomore year, then in 2015.

I was nervous when I attended my first meeting. When I walked into the room, everyone was already formulating ideas and designing their robots. I sat down with the A team and listened to what kind of robot they wanted to make for the Nothing but Net. Every Sunday after that first meeting, I went back to learn more about the robot and about the game. During my first year on the team, I was more of an observer in the design and building process. I ended up being a coach on the A drive team with Elise as driver and becoming more confident in understanding the mechanisms of the robot.

This year I have had a more active role in building the robot for Starstruck. I participated in the afternoon group that met on weekdays as well as Sundays with







two other boys. I was able to contribute in the design and building process, voicing my own opinions and thoughts. I helped to write our engineering notebook. I learned that asking questions was the only way I would learn. Unlike last year, I was not afraid of seeming stupid for asking those questions. I never hesitated to tell my other team members, the boys, if I was confused, or ask for clarification if I wanted more of an explanation on how something works.

During Vex competitions, I notice how underrepresented girls are in robotics. The girls who do participate in competitions are often branded as incapable of making a successful as well as competitive robot. For example, we had just won a qualification match, and one boy from the team we were allied with commented with genuine surprise, "Wow, it's really cool that an all-girl team is actually successful." I'm sure that the boy meant his comment as a compliment, but it was still a little disturbing how surprised he was that an all-girl drive team could have a competitive robot. These instances make me realize how important it is to educate both boys and girls to realize that girls have a role in robotics. Girls can be anything from designers to builders to programmers to scouts.

The Choate Robotics Team fosters an inclusive, diverse environment. Girls and boys come together to innovate, design, and compete with their robots. This year, all the freshmen girls who joined were able to speak up and voice their opinions as well as their design ideas from the first meeting. Even though many girls have joined the team, I still believe that there is more to be done to encourage girls to participate in STEM. By showing girls that their ideas matter and are welcome, I hope that girls will feel that their voices are heard and supported.



# STARSTRUCK

This school year, 2016-2017, seven girls joined for a total of fifteen girls on the Choate Robotics team. We are proud to say that there is at least one girl working on each of our eight competition robots. Each girl is engaged, dedicated, and capable. 6106A, with new member Irie Cooper, is hoping to return to New England's and then Worlds like last year. The 6106A Starstruck robot includes a slip-gear puncher and a rake attached to a 2-bar lift. We can dump both stars and cubes into the far zone, and have a net 16-point autonomous. The success of this robot is due in part to the dedication of four years of female students, making 6106A truly Girl-Powered.



## IRIE'S STORY

I liked fashion and technology, and I joined robotics to learn more about the electronics. I've always wanted to be an architect, because I loved building with legos. My favorite lego structure that I made was the Empire State Building. When I was twelve years old, I heard about the FIRST LEGO League that incorporated legos and robotics, which I thought was cool. I joined FIRST and participated in competitions. In high school, I joined VEX robotics.

The first meeting, when everyone split up into their individual groups, everyone on 6106A welcomed me onto the team. The significant amount of girls impressed me, and made me feel comfortable. At my old school, because of the small amount of girl participants in comparison to boys, I felt that I couldn't voice my opinions. In a way, I felt the boys on my old robotics team were superior, because I had male coaches and the boys' voices always dominated the discussions. At Choate, I have three other girls on my team and feel comfortable to voice my opinions. At Choate, I feel that I am listened to and supported.

Our society is changing. I'm excited to be one of many girls involved in STEM, and I hope that girls soon won't have to feel uncomfortable when participating.