

“Unlikely Champs”

Sandpiper Hexperts – Team 2014F

Sushant Bhopale, Supriti Bhopale, Rishi Iyengar, Sweekriti Ratnam

The crowded gymnasium at Blach Middle School grew silent as a hundred anxious faces peered at the judge. Twenty-four teams battled and persevered at the Los Altos Tournament, with this ultimate goal – win an automatic ticket to the VEX Robotics State Championship.

“And the Excellence Award for Elementary School goes to Team 2, 0, 1, 4...F!”
“What?! What was that last letter?” We needed to know the last letter of the team name, because that was our identity. A half-dozen teams hailed from Sandpiper School, and we were the Sandpiper Hexperts.



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“Did he just say our name? Are you sure we won?” asked Sweekriti with a bewildered look on her face. “Yes, I definitely heard 2014F!” said Sushant confidently. All of us walked up to the stage with smiles on our faces, with a flutter in our stomachs, and with an excitement about the possibilities that awaited us.

So, why might you ask, were we so surprised that we had won? We worked hard, VERY hard. We had great teamwork. In fact, we are all good friends. We persevered through difficult times, including having an almost disastrous start at our first scrimmage, when our robot failed to move. Yet, we were still surprised to hear our name as champs, because the competition was tough and nearly everyone underestimated us.

Who would have thought that a team with two, third-grade girls (with no robotics experience) and two, fifth-grade boys (with limited robotics experience) could have worked so well together? In fact, some had written us off from the very beginning, remarking that only a team full of boys could win.

What do girls know about robotics? Third grade girls can't possibly be on a competitive team. They need a few years to be on a "learning" team. I'm not sure they can take the pressure.

We are so glad that we did not listen to those voices but instead followed our own instincts. We knew the greatest teams are great, not because they have a single-minded view, but because they bring together teammates who have good chemistry, even if they do not agree all of the time. To us, that is the “Girl Powered” motto.

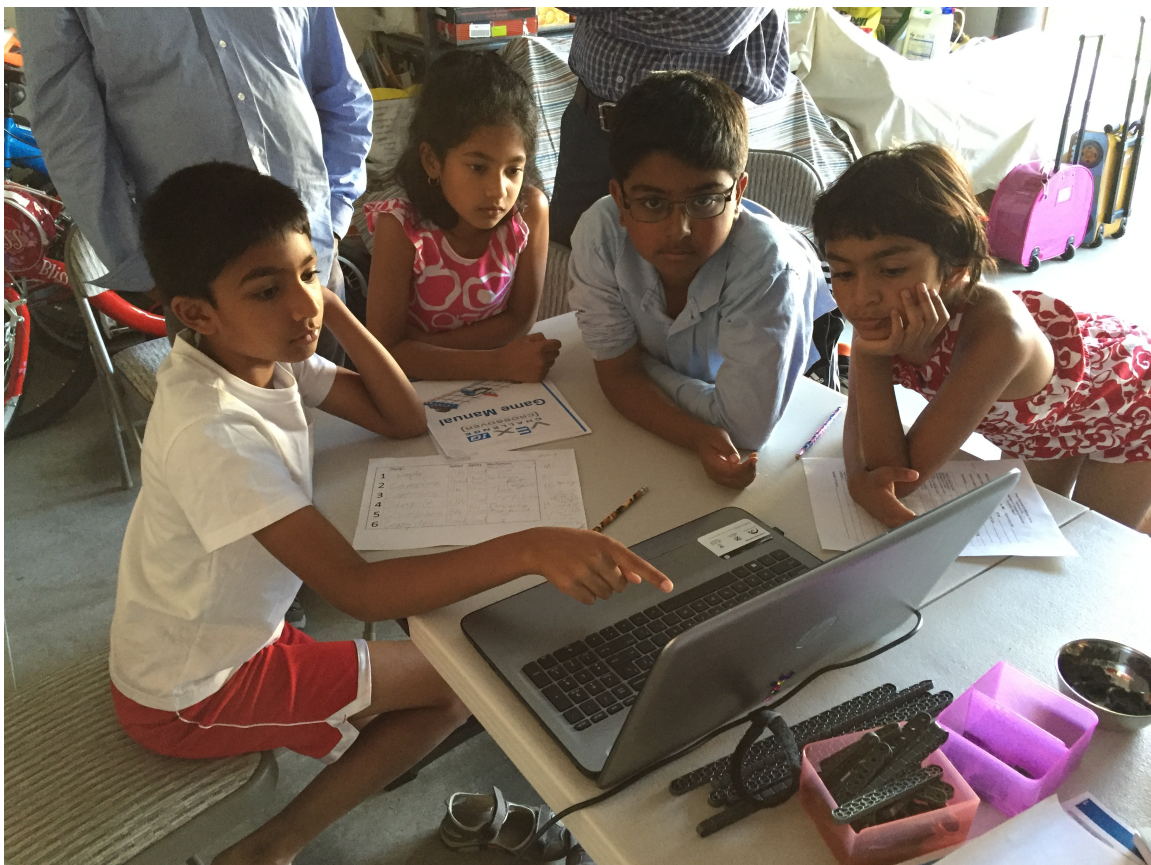
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To have a “girl-powered” perspective, you do not have to be a girl. We all can have that perspective, if we remember that by lifting up the talents of girls, we all get lifted up. That is why we are so proud to have two, strong-willed, girls on our team.

Welcome to the journey of the Sandpiper Hexperts, the most unlikely champions. But, we are getting ahead of ourselves. Let us rewind to our first meeting, where we took nearly two hours to agree on a team name. All of us participate on the Mock Trial Team at school, and we love to argue for our own point of view.



“We should be the Master Crafters. It’s a catchy name, and it rhymes,” said Rishi. “Well, I think Rockin’ Roboticists is better. It’s unique, and we like to dance,”

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countered Supriti. “We don’t dance,” Sushant shot back. That is how it started and continued for two hours.

Somewhere in the middle of our arguments, the parents decided to call for a break, and we watched videos of robots to spark some ideas for design. Getting away from the arguments about our team name cleared our heads, and when we resumed discussion, we agreed on a name for our robot and team quickly.

“We believe in robotics, right? Aren’t we believers?” asked Supriti. “Believers, achievers, fevers...” someone mused. “What a minute. We are using hexballs that we heave. What about Hexball Heaver?” proposed Sweekriti. “Hey, that’s a great name for our robot!” exclaimed the boys. Whew! Robot name was done. Team name left to do.

Somehow, we started talking about Harry Potter, and that led us down a path of “Hogwarts, Hexwarts, Hextables, Hex-ers, Hexonics, Hexians.” This discussion was endless and not very productive. “Aren’t we experts in robotics?” asked Rishi. “Well, not yet,” Sweekriti said reluctantly. Then, someone blurted “Hex-perts.” One by one, we all agreed to the name, with Sweekriti the last holdout because of her concern that she was definitely not a robotics expert, at least not yet.

That was our first agreement and disagreement, among many to come. The time we took that day to sort out our differences about our team and robot name was important. It helped us have better teamwork, and even though we had different views, we worked together to find a team name that we all liked. In the end, we felt like we had really accomplished something that day, and that was the first time we showed our team cheer.

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After our team and robot names were decided, we turned to our STEM project, which ultimately became entitled as the “Effect of Acupressure on Blood Pressure and Heartrate After Exercise.” Like nearly everything else, each of us had our opinions, and none of us were shy to share them.

“Does anyone have an idea for our STEM project?” our mentor asked. All four hands shot up. “How about the effect of video games on blood pressure?” proposed Sushant. “Or the effect of exercise on heartrate,” Rishi said. The ideas just went on and on: robots to help with dyslexia, robots helping in surgery, the effect of TV shows on heartrate, the effect of music on blood pressure, the effect of exercise on appetite.

One idea in particular demonstrates how far our brainstorming went. Sweekriti suggested that we experiment the effect of band-aids on wounds. “But wouldn’t we have to first cut the fingers of our patients?” asked Sushant. “Yes, that would be a problem,” agreed Sweekriti, our STEM lead. “Hmmm...we keep bringing up blood pressure and heartrate. How about the effect of acupressure on blood pressure and heartrate,” suggested Supriti. “And, let’s make a robotic acupressure device to go with our STEM project,” suggested Rishi. Everyone finally agreed!

Our next challenge was to actually design our robot to gather the most hexballs into the goals and get the maximum number of total points. Before long, we realized the key was to get our robot parked on a balanced bridge, because doing so would give our team a whopping 25 points.

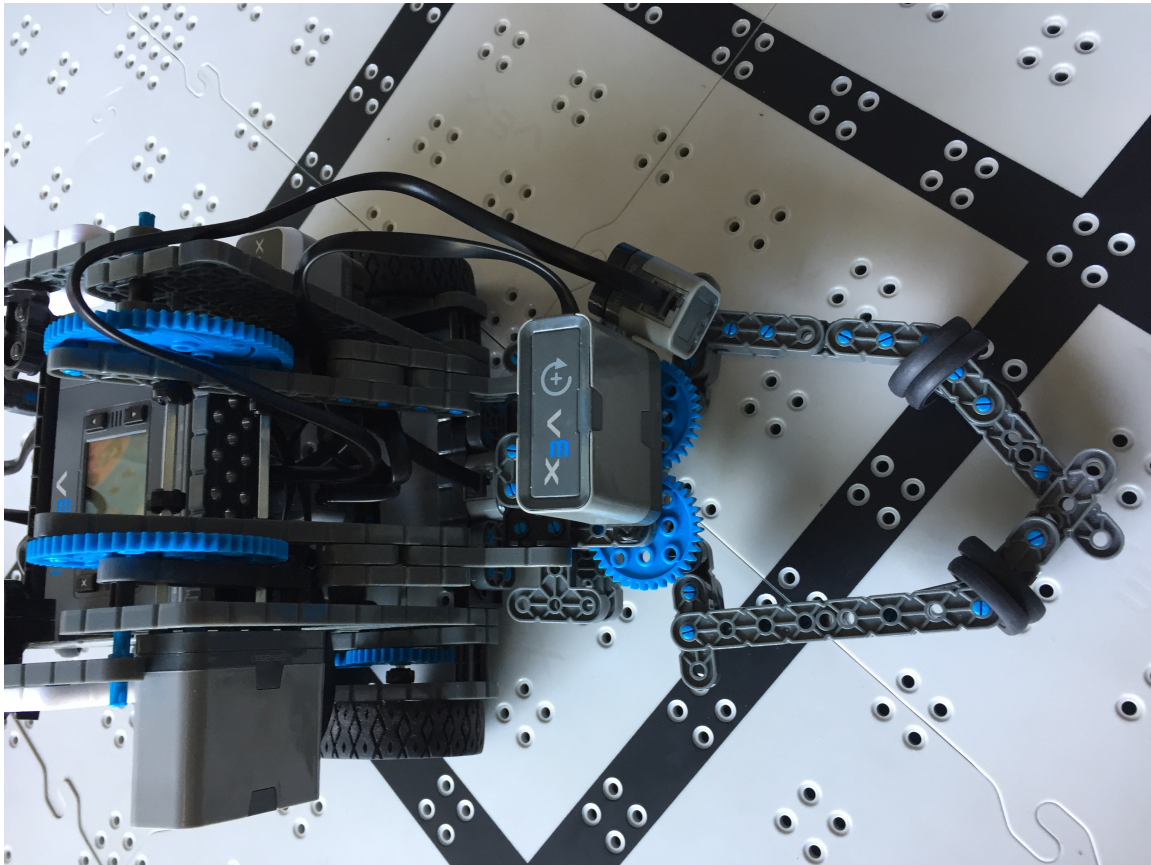
We needed a robot that was fast, agile, and could deliver the hexballs into the goals easily. Our initial design was a clawbot. In our first scrimmage, however, we

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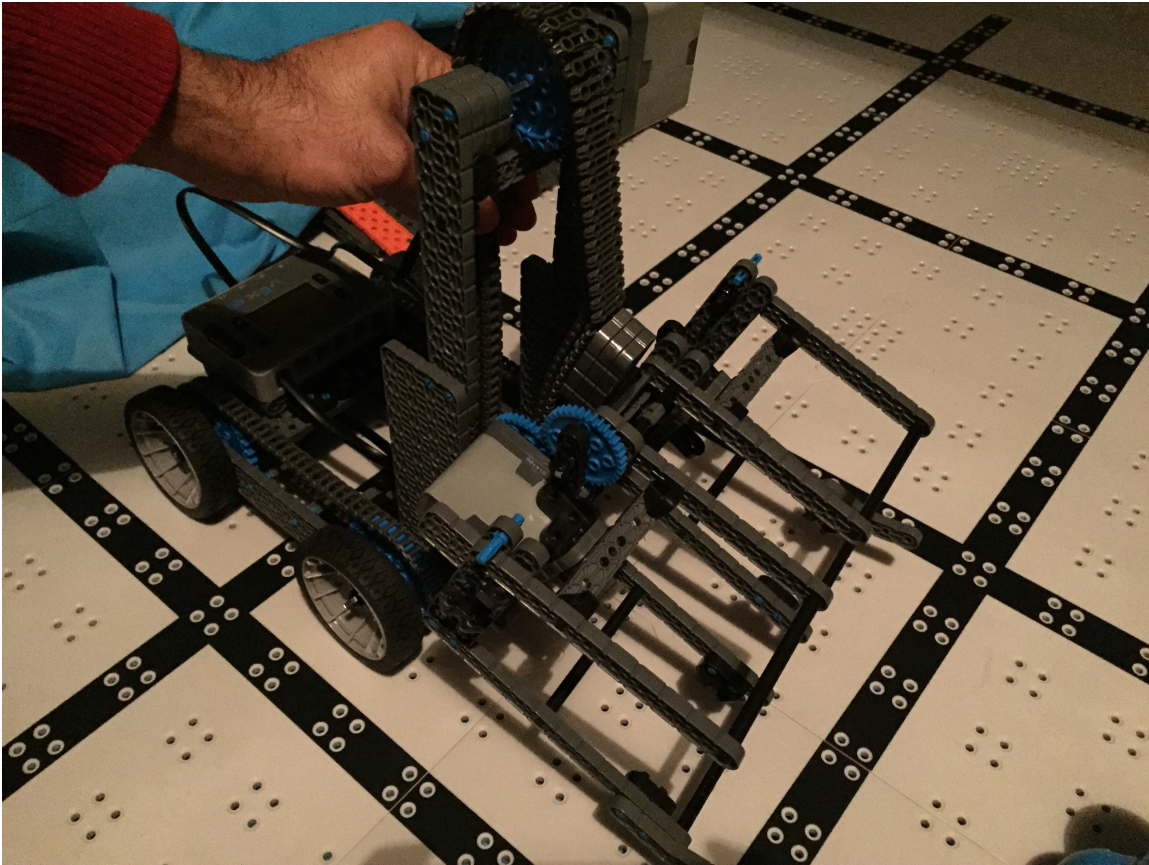
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realized that our design was very limited. The clawbot could give us about 30 points at most, and we knew that was not good enough.



Back to the drawing board we went. We considered forklifts, other clawbot designs, and conveyer belts. In the end, we decided upon a modified, forklift design that carried two balls at one time.

This design was good enough to score 35 points consistently in the driver's skill challenge, with our brother-sister duo of Sushant and Supriti as drivers, and it scored us a top score of 65 points with another robot in the teamwork challenge at the Los Altos Tournament. Not bad!



That left our last challenge – programming. We wanted our programming to score us 35 points, equal to our driver’s skill challenge score. As with the driver’s challenge, our strategy was for the robot to use one goalpost as leverage, grasp a few hexballs, travel over the bridge backwards, turn around, and use the opposite goalpost as leverage to deposit the hexballs into the goal. If we did that just once and parked on a balanced bridge, we would score 35 points. Making this happen was easier said than done. At first, with the program we used, our robot was not picking up or retaining the balls correctly. Our robot would pick up a hexball one time, but not capture it the next time that we used the exact same code. Strange!

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“Boy, this is frustrating. What are we doing wrong?” asked Sushant, scratching his head. Rishi, who was our programming lead, suggested that we analyze the problem step by step. We soon figured out that our robot was giving us inconsistent results because of different starting points. If our robot started offset from the center by even a mere centimeter, our code would fail. The robot had to be lined up just right for the code to work.

“But every VEX field might not be set exactly the same. Won’t that be a problem?” asked Supriti. “Yes. I think the programming strategy we are using is too risky. If our code fails, we could end up with zero points,” said Sweekriti. Ultimately, we played it safe and constructed a code, so that our robot simply parked on the balanced bridge for 25 points. We knew that code would work on any field! Though we walked into the tournament unsure of the strength of our programming score, we were pleasantly surprised to find that many other teams also used the same strategy. In fact, some robots were unable to even get onto the bridge. At least for the Los Altos Tournament, our safe bet paid off, and we felt good in the choices we made.

Driving south on 101, the four Hexperts start daydreaming in the minivan of their mentors. As they head to the State Championship in Santa Clara, hoping for another Excellence Award and a possible ticket to the World Championship, the team has mixed emotions about what the future holds.

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“We could make it to World’s, but the competition is tough,” says Sweekriti, always the realist. “We’re gonna do it!” exclaims Rishi, doing his best to cheer up his teammates. “Guys, we just need to think positive and try our best,” pleads Sushant. “No one expected this of us. We’ve made it this far because we trusted in each other, even when others did not,” Supriti whispers. Supriti’s soft words rouse another Hexpert cheer. How does the Hexperts’ story end? Only time will tell.



CREDITS:

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(left to right: Supriti Bhopale, Sweekriti Ratnam, Sushant Bhopale, Rishi Iyengar)

HEXPERTS

Hilarious

Enthusiastic

Xtreme

Perseverant

Enterprising

Responsible

Trustworthy

Supportive