

The
GIRL'S GUIDE

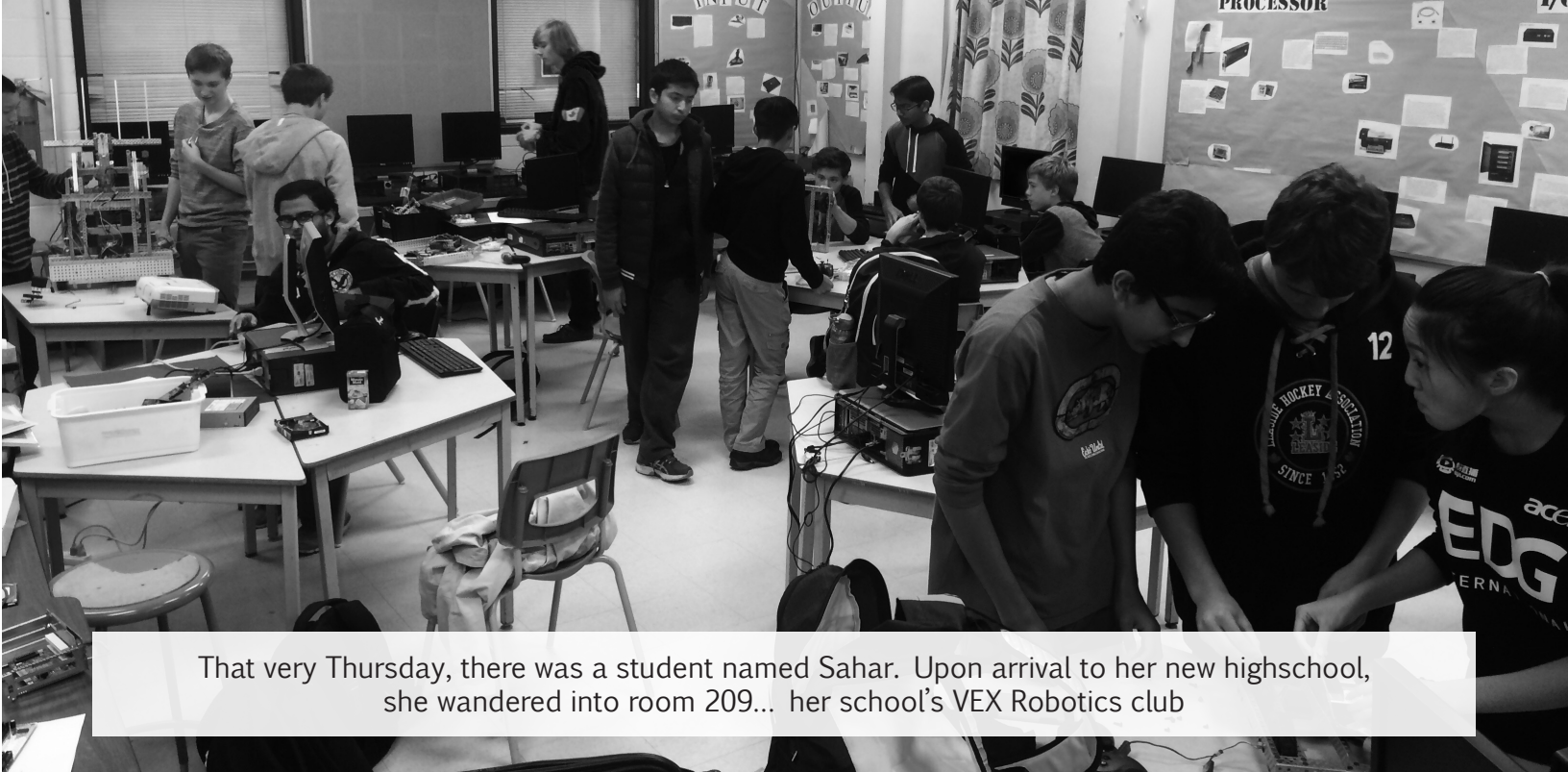


to a (VEX)ing

Universe



DON'T.PANIC.



That very Thursday, there was a student named Sahar. Upon arrival to her new highschool, she wandered into room 209... her school's VEX Robotics club

Here's what the Encyclopedia Robotica has to say about VEX robotics. It says VEX robotics "offers students an exciting platform for learning about areas rich with career opportunities spanning science, technology, engineering and math (STEM)."

The Girl's Guide To a (VEX)ing Universe also mentions robotics. It says that VEX Robotics is a world of its own - the best robotics competition in existence. The effects of VEX are like having your eyes opened to a whole new way of thinking and problem solving.

The Guide even tells you what you need to join the VEX universe as well.

First, you need team members.
42 is a good number, yet if you cannot find that many interested parties. 18 is good as well.

Of those 18 members, you need at least one programmer and one builder.



Who's that beautiful girl?
Oh right, that's me!

Yes, We are dabbing, and
no, it never gets old



Hi, my name is Sahar and
I'll be your narrator for the
day. Please prepare yourself
for my attempts at poetry
and my terrible sense of
humor

On Sahar's way into the room, she met Maria, a classmate. Maria explained that she was seeking the VEX universe where she believed she could find the answer to

THE QUESTION OF **ENGINEERING**, THINGAMABOB & EVERYTHING

To achieve her goal, she needed someone who understood programming syntax.
She asked Sahar for her input.

Sahar wasn't convinced. She said:

IT IS A **MISTAKE** TO THINK YOU CAN SOLVE ANY **MAJOR PROBLEMS**

Er. VEX Parts
WITH POTATOES

Maria simply shrugged and dragged her off to see her robot.

"We're having... a bit of a problem," Maria explained.
"The claws on our robot won't align!"

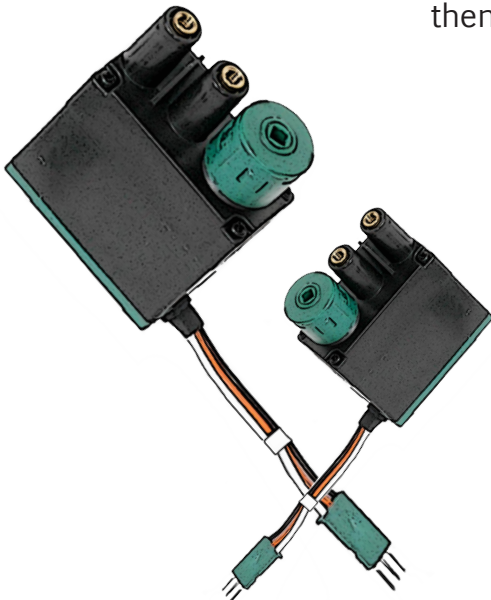
"Hold up," cried Sahar - she didn't even know what the robot was for!



"To throw stars is the aim,
But this ain't no videogame -
We're using claws
10 motors as well
Following Newton's laws
We want to excel!"



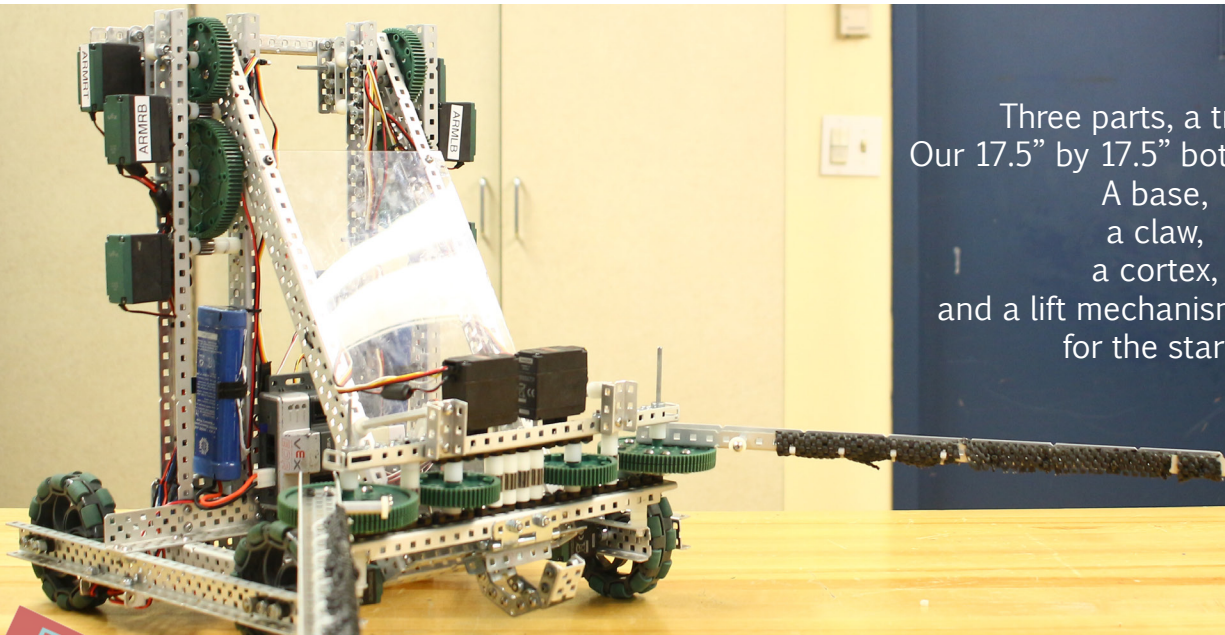
Maria shoved the laptop at Sahar,
then started explaining the bot from afar.



First, we had to brainstorm,
Then we gathered our tools,
Ready to transform
These hunks of metal into the pride of our school.



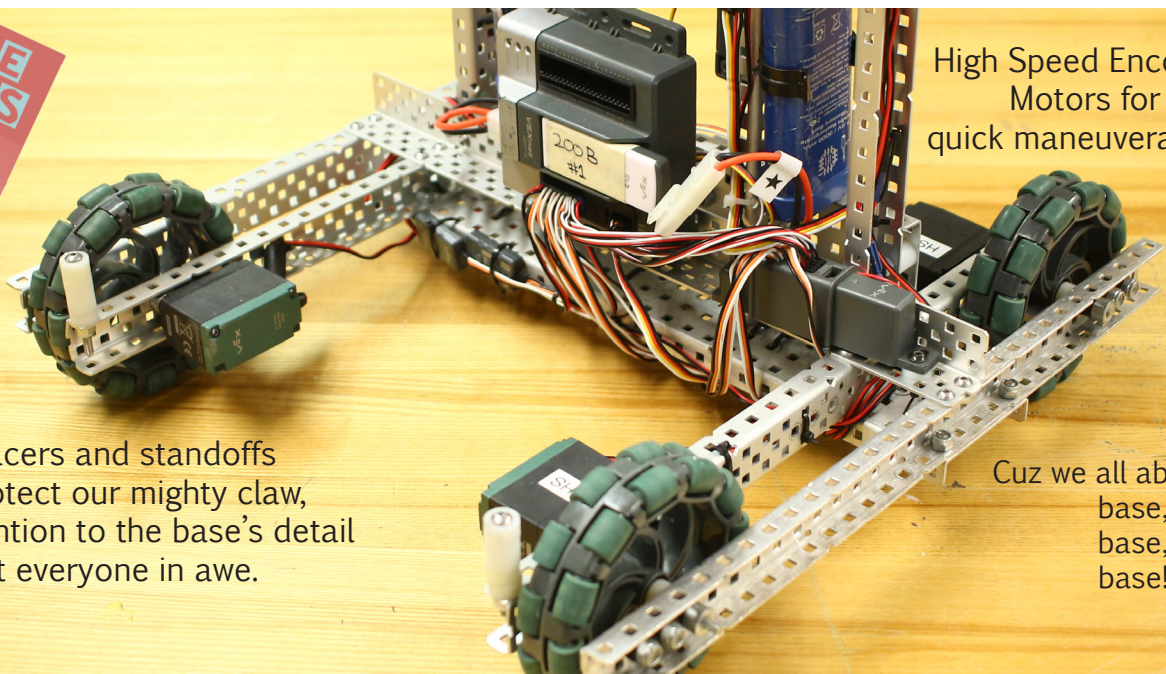
Three parts, a trilogy,
Our 17.5" by 17.5" bot had dignity
A base,
a claw,
a cortex,
and a lift mechanism to reach
for the stars!

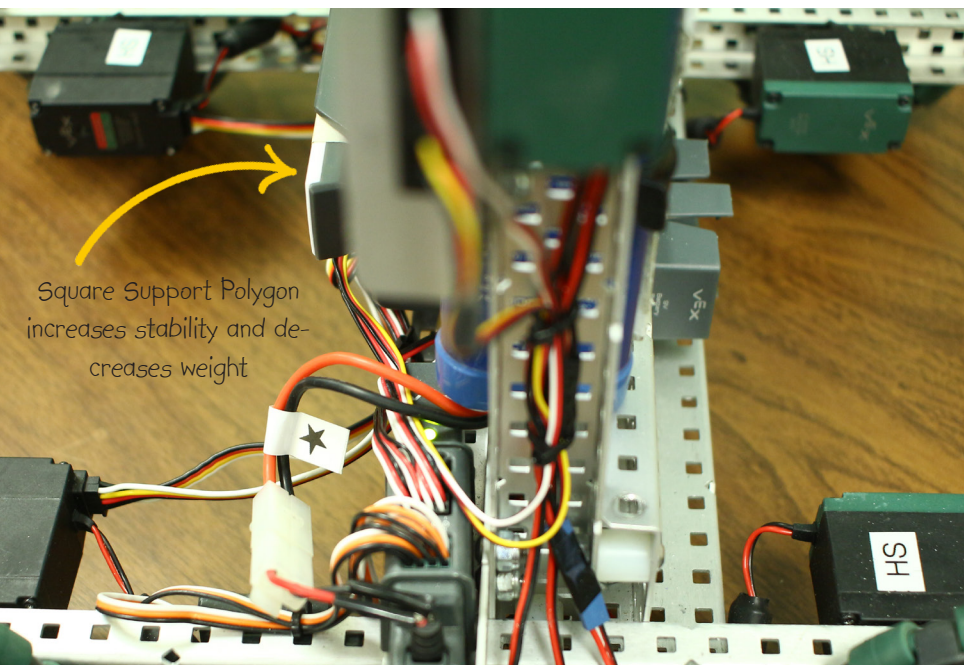


Spacers and standoffs
to protect our mighty claw,
Our attention to the base's detail
left everyone in awe.

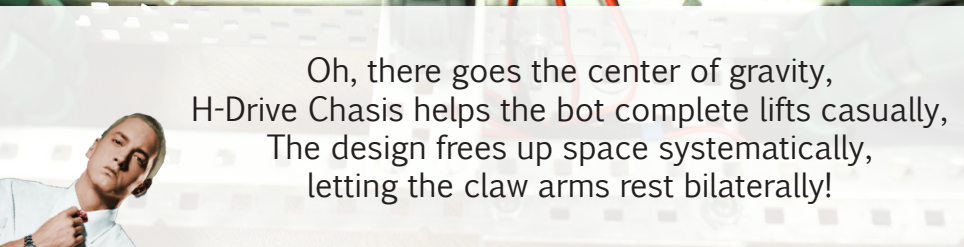
High Speed Encoded
Motors for
quick maneuverability

Cuz we all about that
base,
base,
base!

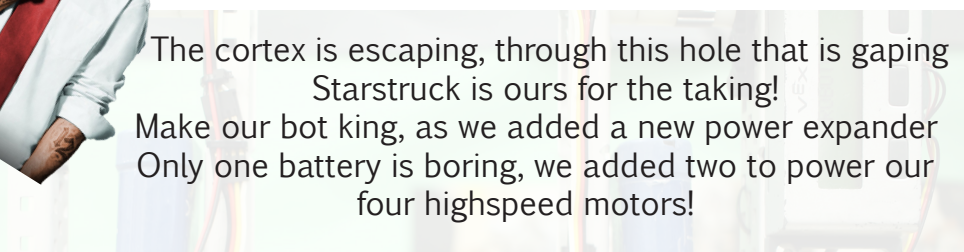




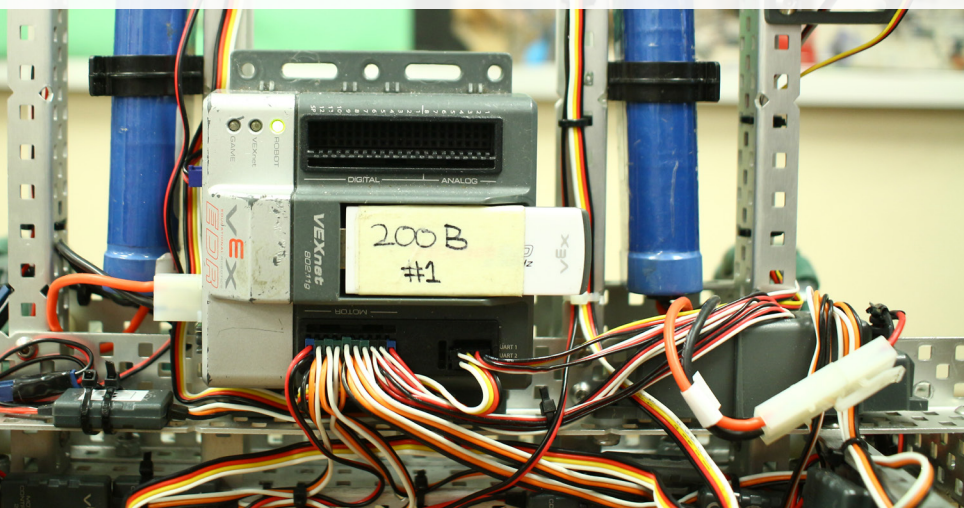
Square Support Polygon
increases stability and de-
creases weight



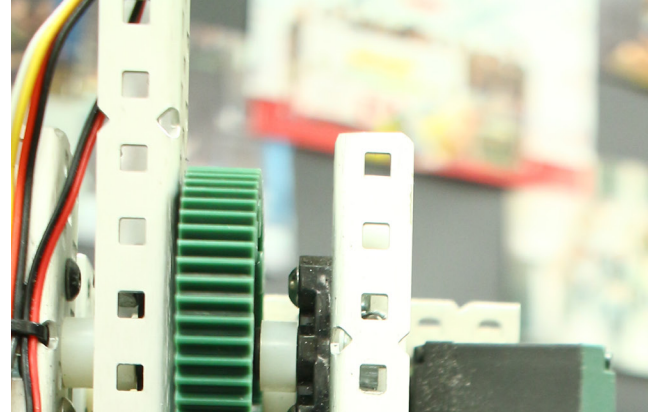
Oh, there goes the center of gravity,
H-Drive Chassis helps the bot complete lifts casually,
The design frees up space systematically,
letting the claw arms rest bilaterally!



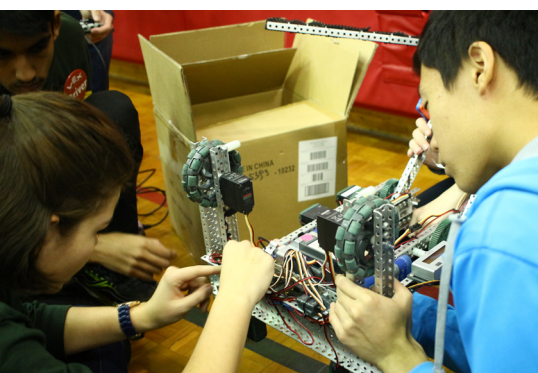
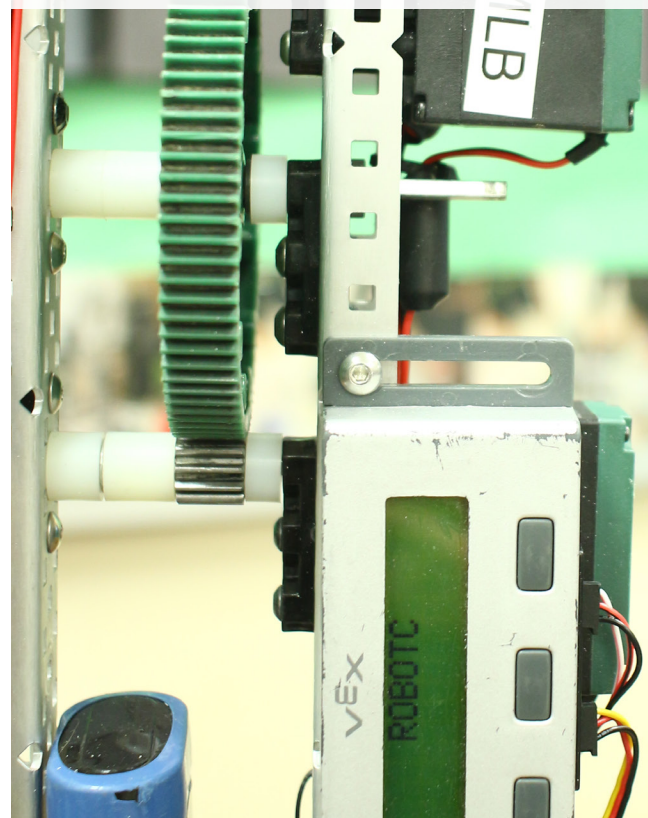
The cortex is escaping, through this hole that is gaping
Starstruck is ours for the taking!
Make our bot king, as we added a new power expander
Only one battery is boring, we added two to power our
four highspeed motors!

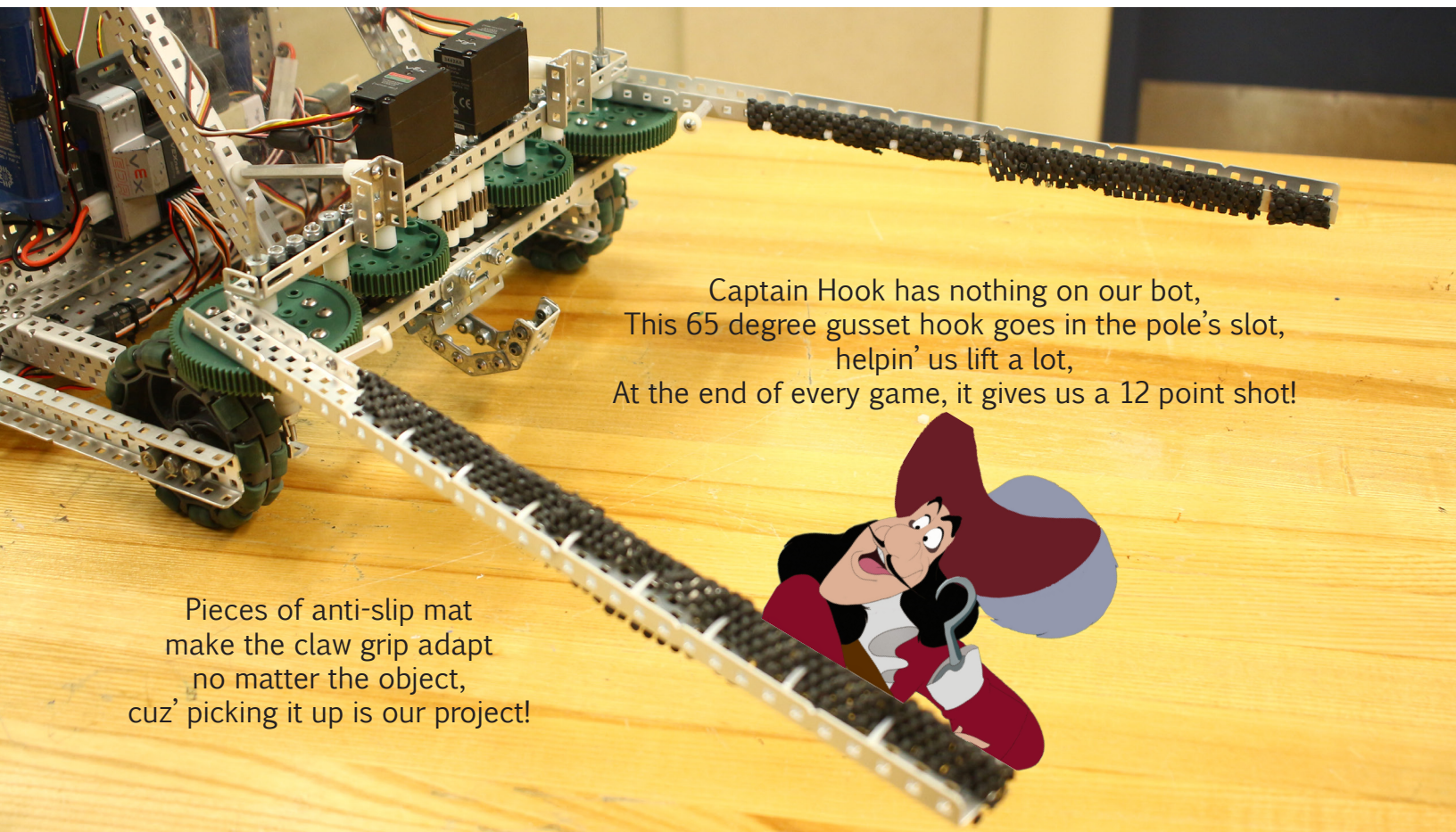
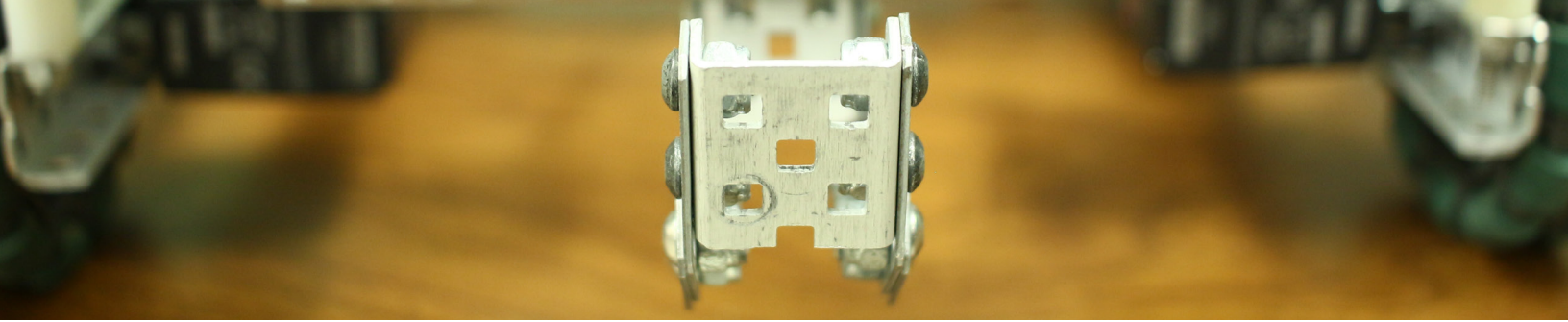


The battery voltage is portrayed,
On this green LCD display!

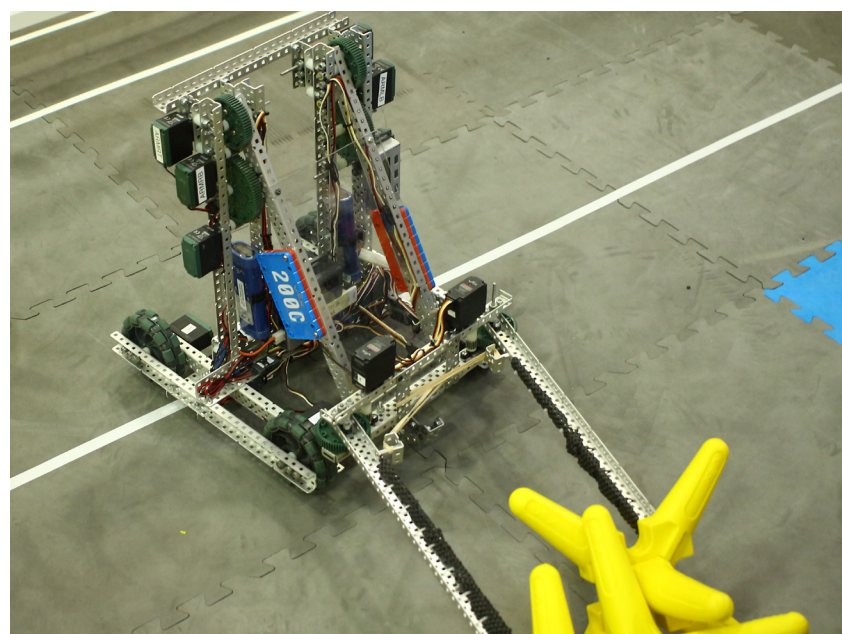
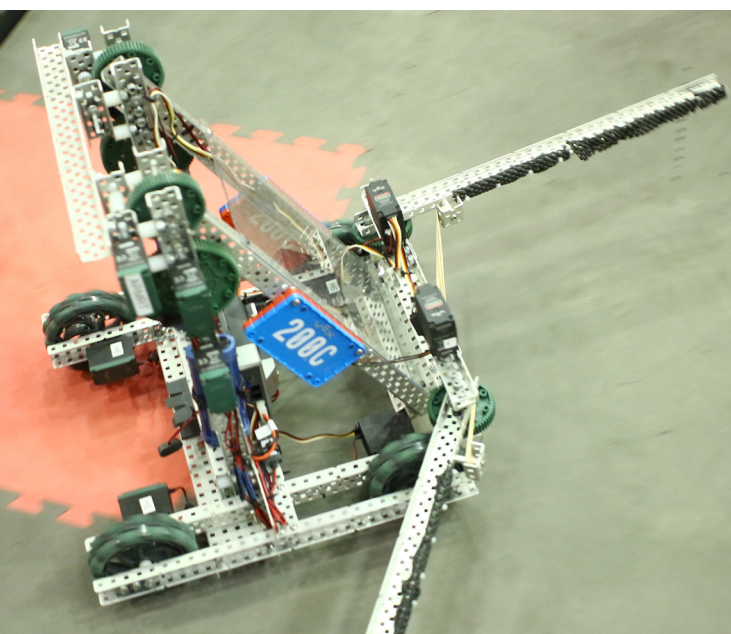


Wide tooth gears for the win!
'Cuz they are less likely to skip when
the motors begin!





But not all is well with our claw,
'cuz it has a major flaw!
As the motors clink
they would never be in sync!





Sahar sat down, laptop in hand
To save the day was her plan.

She examined the code,
Scrolled through Github examining every upload

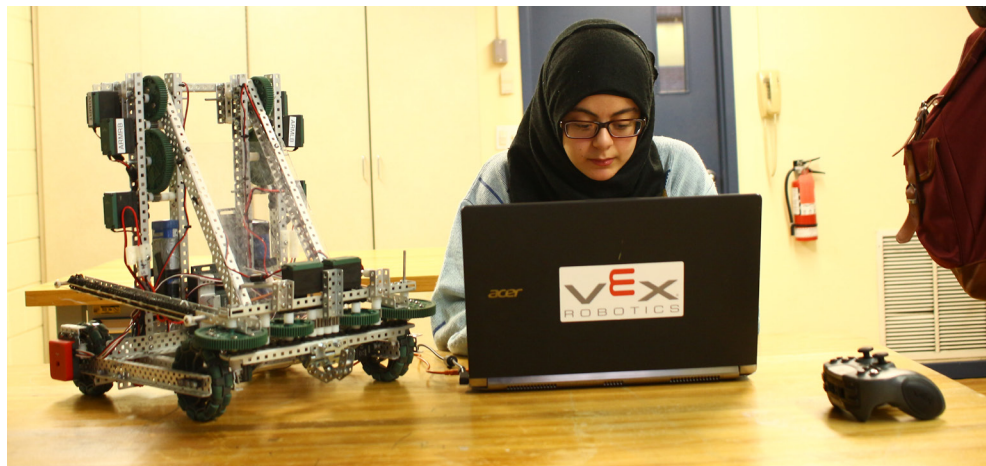
Until she realized she was in a different territory,
She came to a conclusion most revelatory -
She's never ever used RobotC!

She cracked her knuckles, 100% ready
To put her pedals to the metal,
And meddle.

She learned all
she could from the
handy guides,
The internet
provides.

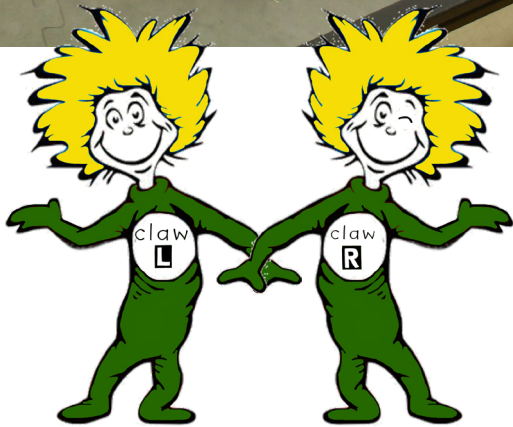
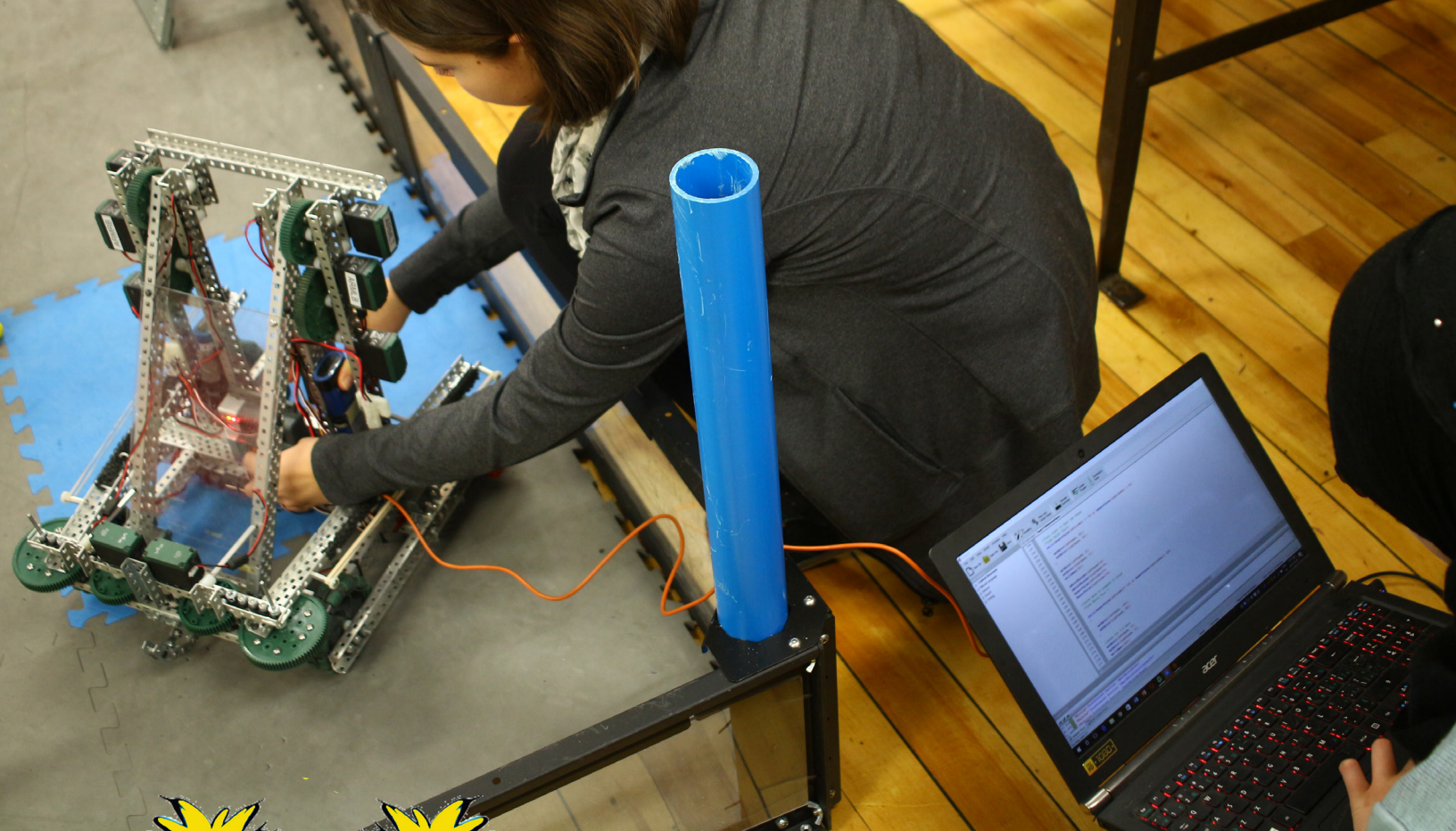
Now prepared,
She readily stared,
At the screen,
Until her eyes took
on a fanatic gleam

Scroll, Scroll, Scroll your code,
gently down the (robot)C,
VEXily VEXily VEXily
auton is but a dream!



```
print("Hello, world!")
```

Time to debug!
She said with a shrug,
Bring the robot near,
Lets plug the laptop to the cortex over here.



They changed the claw motor variables,
Claw L!
Claw R!

INCREASED
DECREASED
REVERSED

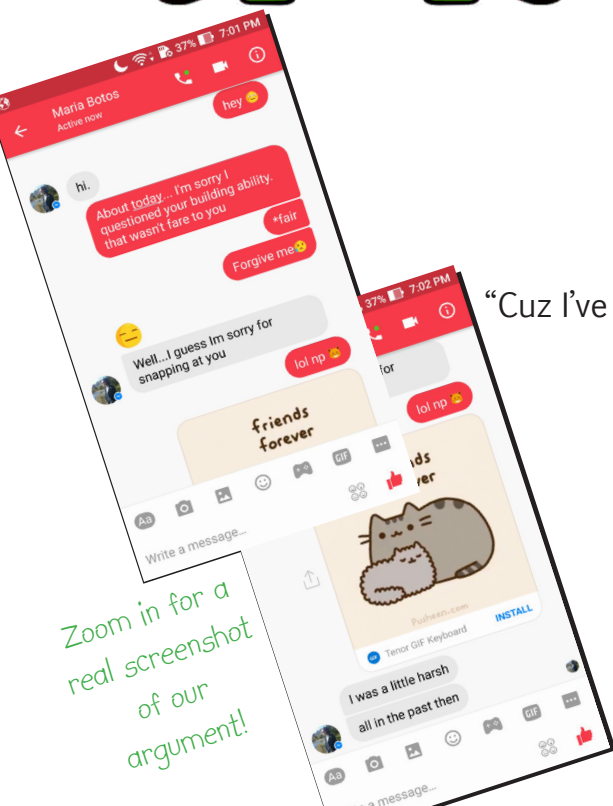
Replaced!

Nothing they did made a change.

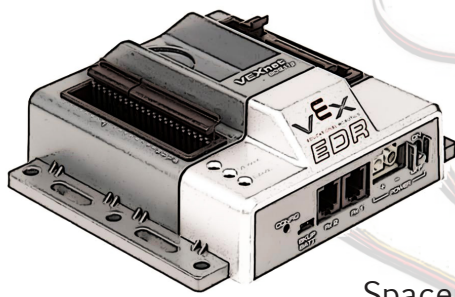
“Are you sure this is a coding error?!” Sahar exclaimed
“Cuz I’ve been staring at this all day, and it should work like it’s supposed to.
Maybe the build wasn’t as perfect as you proclaimed -”

Maria snapped, all frustrated and angry.
“You try building it - it’s harder than it seems!”
With that she stormed off, 100% cranky.

Spooked and contrite,
Sahar called it a night.
She’d message Maria late -
Hopefully she only yelled because she was tired and irate.



The next day, they sat back down,
Completely wiped away every sign of their previous meltdown.
They examined the robot one more time.



Cortex!

Wiring!

Spacers, washers, nuts and nylocks too!



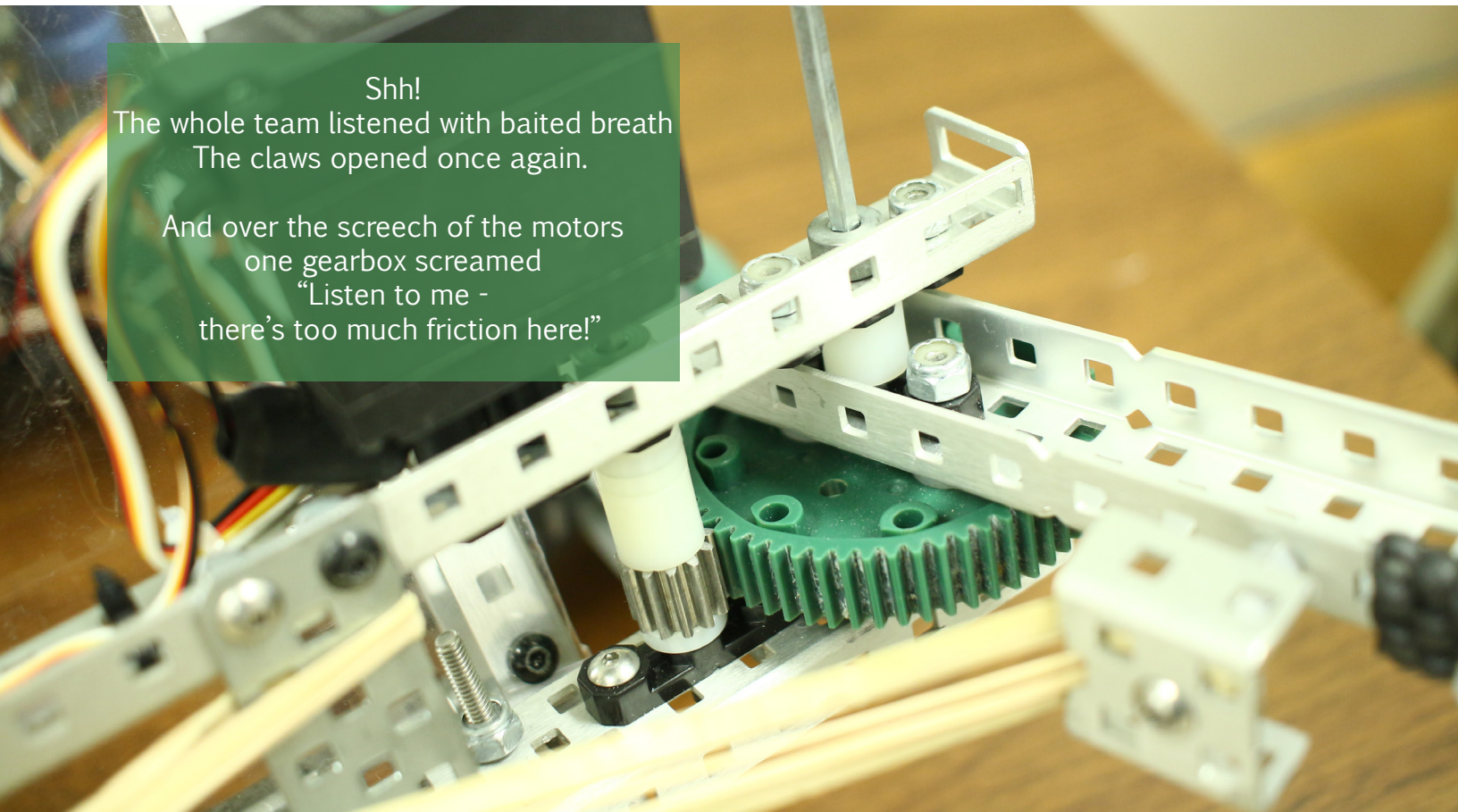
But nothing changed the performance.
So it was time to undo
The claw itself -
and figure out the major issue.

Wait! What's that!?

Maria's keen eye
Caught and demystified
The curse of the unaligned claw.

Shh!
The whole team listened with baited breath
The claws opened once again.

And over the screech of the motors
one gearbox screamed
"Listen to me -
there's too much friction here!"



Everyone breathed a sigh of relief.
Finally that one problem could be fixed.
Yet they didn't take into account,
The work that would come next.

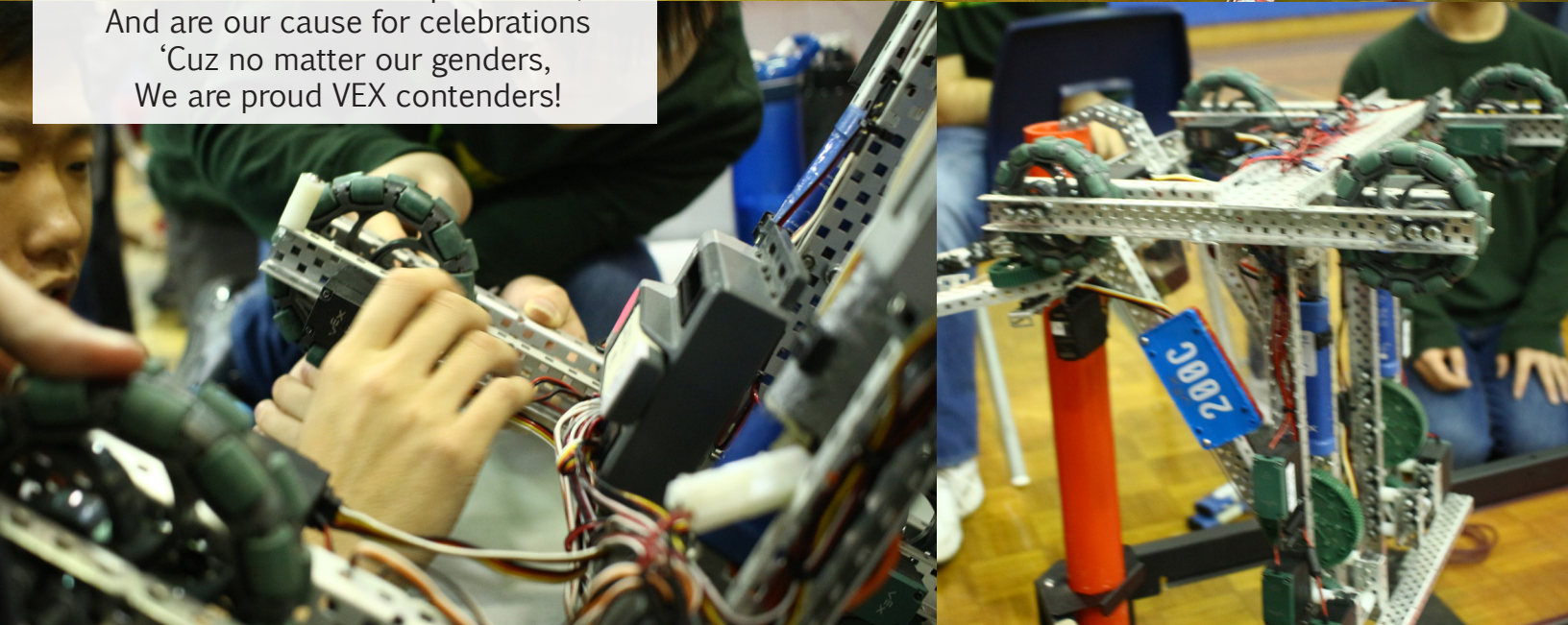
But Sahar didn't mind,
Deciding to stay for the ride.

Still dabbin'

And this, dear readers, was how Team 200C solidified.



One hell of a team,
we're all more than we seem
Our abilities exceed expectations,
And are our cause for celebrations
'Cuz no matter our genders,
We are proud VEX contenders!



Hello! If you've gotten this far, I hope you enjoyed my Girl Powered story as much as I enjoyed writing it. Now, this is a disclaimer: this story is part fiction, part truth, and three-quarters hyperbole. The problem with our claw really did happen, but it's not exactly how I joined VEX and Robotics. Other elements remain true - such as our debugging process, communication argument, and the subsequent source of the problem.

Now, my history with VEX spans quite a few years. I vaguely remember in my brother speaking of robots and competitions - but I never really listened when I had more important things to do (such as annoying him after my elementary school, or playing with my Lego).

In Grade 10, my friend Maria really did play a big part in getting me to join - she dragged me to my very first meeting! Before then, I had only taken a computer programming course, and didn't exactly know what to do with my newfound skill. VEX robotics provided me with a context to use and better my programming skills. It also piqued my interest in Engineering - in Grade 11, I took more computer technology courses, physics, and chemistry. Currently, I have applied to Engineering programs in University. It really helped that robotics was a team effort that allowed students to apply their knowledge in a real-life endeavor.

I also learned a lot about what it takes to work in team, especially one that focuses on applications of STEM. I made mistakes, (occasionally lost my temper), but more importantly, I learned. If I had to sum up my experiences in a listicle, it would look something like:



LOOK! A mini drivers' argument!

The 5 most Important things to a VEX Programmer



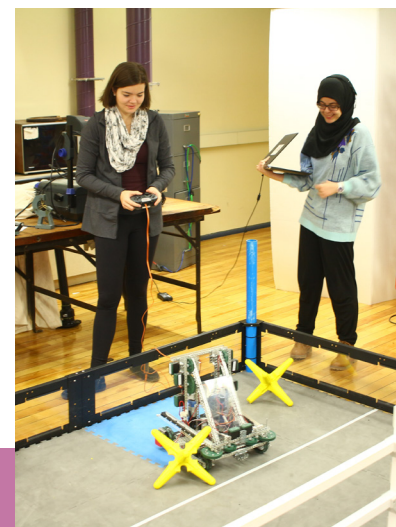
SaHARD at work #soproductive #much code
#masseffect

1. Arguments happen. A lot. But learn to clear the air and you'll be fine.
2. Comment your code like your grandmother was going to read it. It will save you a lot of time and questioning.
3. Carry your laptop with you all competition or evolve a pouch like a Kangaroo. Either way, prepare for the dance I like to call "Chasing-after-the-bot-by-an-orange-wire".
4. Your orange wire (scientifically known as the programming cable) is going to be your fashion statement for the rest of the year. Wear it with pride.
5. Work hard and it'll pay off!

I'm not going to sugar-coat this - at first I was wary, because I read about the lack of women in computer science and engineering. What if I stood out? What if they didn't take my ideas seriously? What if I say something stupid?

I'm glad to say that in Lancebotics, my fears were completely unfounded. As a new member, I was taught what I needed to know, and allowed to test out my ideas. Not once did I feel excluded or looked down upon. Everyone I met was extremely helpful. I made new friends, had a blast, and learned more about engineering and computer science than I could have ever been taught in a class.

At our first competition, I truly felt part of the team. Lancebotics is not all girls, and not all boys - its a co-ed environment where our gender does not precede our abilities. That very feeling is what come to mind when I think of "Girl Powered". The ability to set your mind, do something, and be taken seriously. I have never felt more capable nor more proud than when I am working on our team robot. Our team embodies this whenever we can - Maria and I regularly bring our sisters to competitions, and we make a point to talk to the children who come by with questions. Our efforts ensure that Lancebotics stays a friendly environment regardless of race, gender or sexuality. And personally? I believe this approach is working, as this season, 6 more girls joined across all three teams. Lancebotics is #girlpowered and proud!



Credits:

Written by Sahar Abdalla, Team 200C

The Girl's Guide to a (VEX)ing Universe

Created with Adobe Photoshop and Indesign

Photographs: Timothy Yeung, Sylvia Gehring, Truman Thompson. Special thanks to Mr. Lu and Cindy Chen!

[1] The title and introduction are parodies Douglas Adam's amazing book (The Hitchhikers Guide to the Galaxy), a book that started me down the path of science (and fiction). 42 is still the best number, as well as the Answer to the Ultimate Question of Life, the Universe, and Everything!

[2] Meghan Trainor's song cover (All About That Bass) was parodied on page 4 (No trouble, please) ★~(◡●❀)

[2.5] Source: https://i.ytimg.com/vi/IV_w_ZZ04Bs/maxresdefault.jpg | Image modified by Sahar Abdalla

[4] Eminem belongs to Eminem (and I parodied "Lose Yourself", so the beat is his as well!) Page 5

[4.5] Source: http://hiphopgoldenage.com/wp-content/uploads/2015/08/eminem_color_touch_by_mizicko705-d3blvpd.jpg | Image modified by Sahar Abdalla

[3] Captain Hook belongs to Disney. No copyright infringement intended. Page 6

[3.5] Source: http://img00.deviantart.net/e5ab/i/2013/270/4/a/captain_hook_by_sperry1977-d6o4ma3.jpg | Image modified by Sahar Abdalla

[5] VEX parts and VEX logos all belong to their respective owners. Images taken from VEX sale website.

[6] Python, Java, RobotC and Github logos all belong to their respective owners.

[7] Thing One and Thing Two belong to Dr. Suess' Estate. No copyright infringement intended.