Kenan

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(4-5)	The team
(6)	Introduction
5/2 (7-8)	Planning out the drive train prototype
5/8 (9)	Coded the prototype
5/9 (10)	“Cool Bot” planning
5/10 (11)	“Cool Bot” friction reduction
5/15 (12) 5/22 (13)	We attended the school science fair Field, Time management
5/29 (14)	Field construction
6/5 (15)	Cleaning/organisation
6/7 (16)	“Cool Bot 2.0” prep
6/12 (17-18)	“Cool Bot 2.0” Drive train construction
6/13 (19)	“C.B.2” Drive train construction
6/22 (20)	Drive train 1 Completed
7/13 (21)	“Drive train 2” Planning
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8/1 (23,24)	“Catapult 1” planning, endgame research, “intake 1 sensors”
8/3 (25)	“Catapult 1” graphing
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8/21	Strategy
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9/11	Intake 1 “construction” Drive train 2 construction
9/12	“Intake 1 construction catapult 2 construction
10/8	“Prote wings, reachered/graphing
10/13	“Intake 1” tunning
10/14	Testing
10/15	“Wall rollers” maintenance
10/19	“Climb over middle pipe”
12/15	Drivetrain 4
12/19	Wings 4
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Kenan

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The Team

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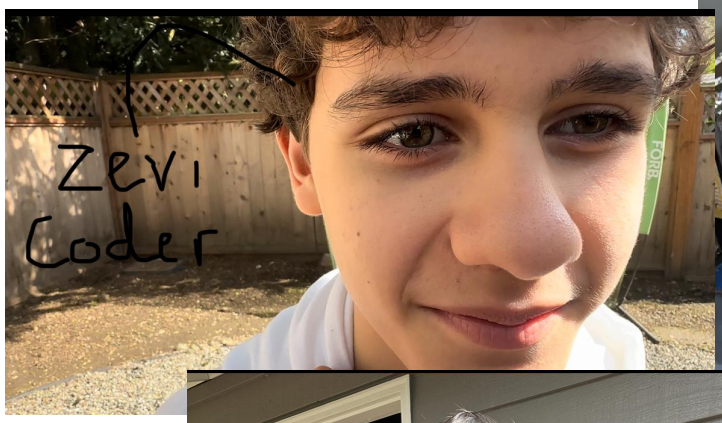

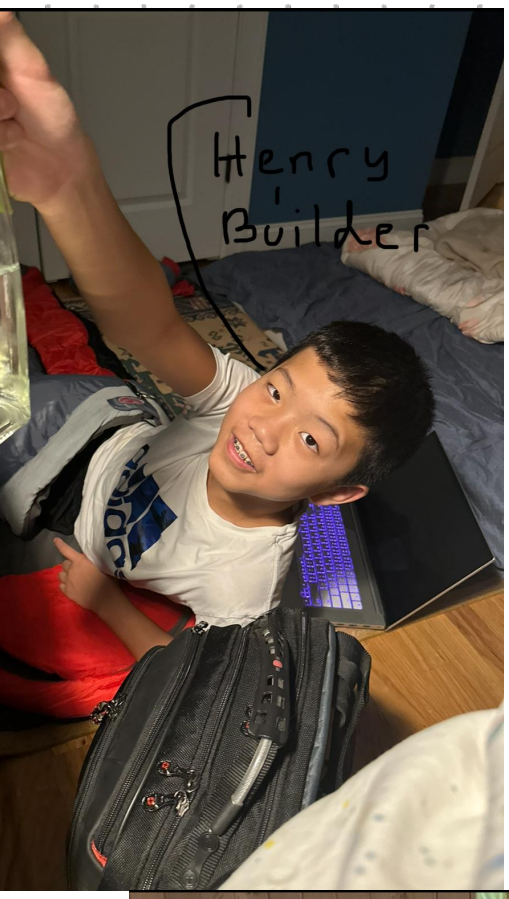

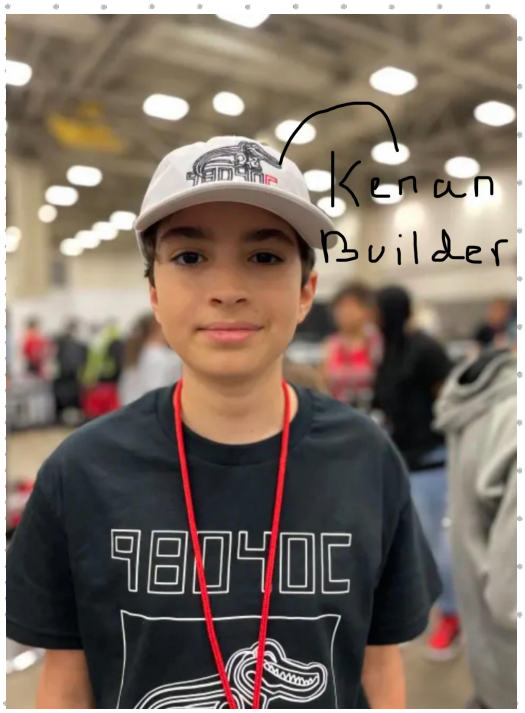

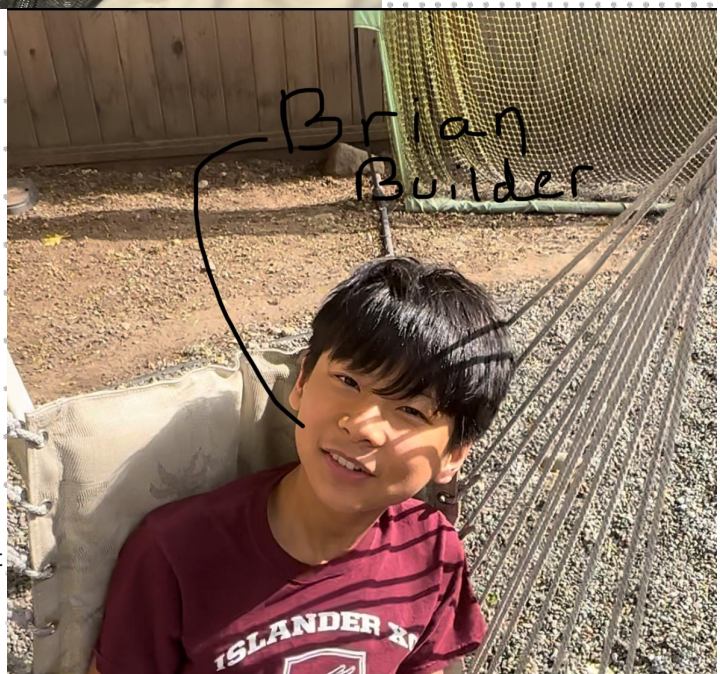

Project Name

Date

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The team pt2

The roles that you see on the last page were as of after worlds. We were excited to have gotten a new member in Til as he will be joining us this year. Every member on the team has a valuable role and by everyone doing their role we got stuff done.

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Introduction

Our team is a self run group from Mercer Island, Washington. There are 7 members in our team(minus our coach). We all have at least one year of experience in vex, this is with the acception of our newest member Til. All members tend to help in all roles but are assigned main jobs to focus on.

Brian	Builder
Kenan	People person, builder
Harry	Driver, leader
Henry	Builder, engineer
Til	Helper, match loader
Jermey	Notebook, match loader
Zevi	Coder

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Day pt1

To first day part 2

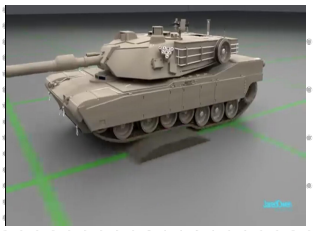
Attendance: Brian Harry Jeremy Til Kenan Zevi

Today was a day used primarily for planning due to the youthfulness of the season. We came up with 3 main points to start on.

-Driving
-Tri balls
-End game

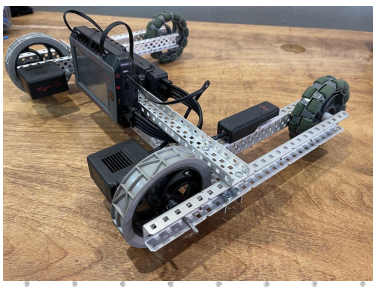
We decided to tackle driving first due to it being the seemingly most essential part of the robot.

We wanted the robot to be able to get over the divider in the middle so we divided 3 ideas.



treads

legs



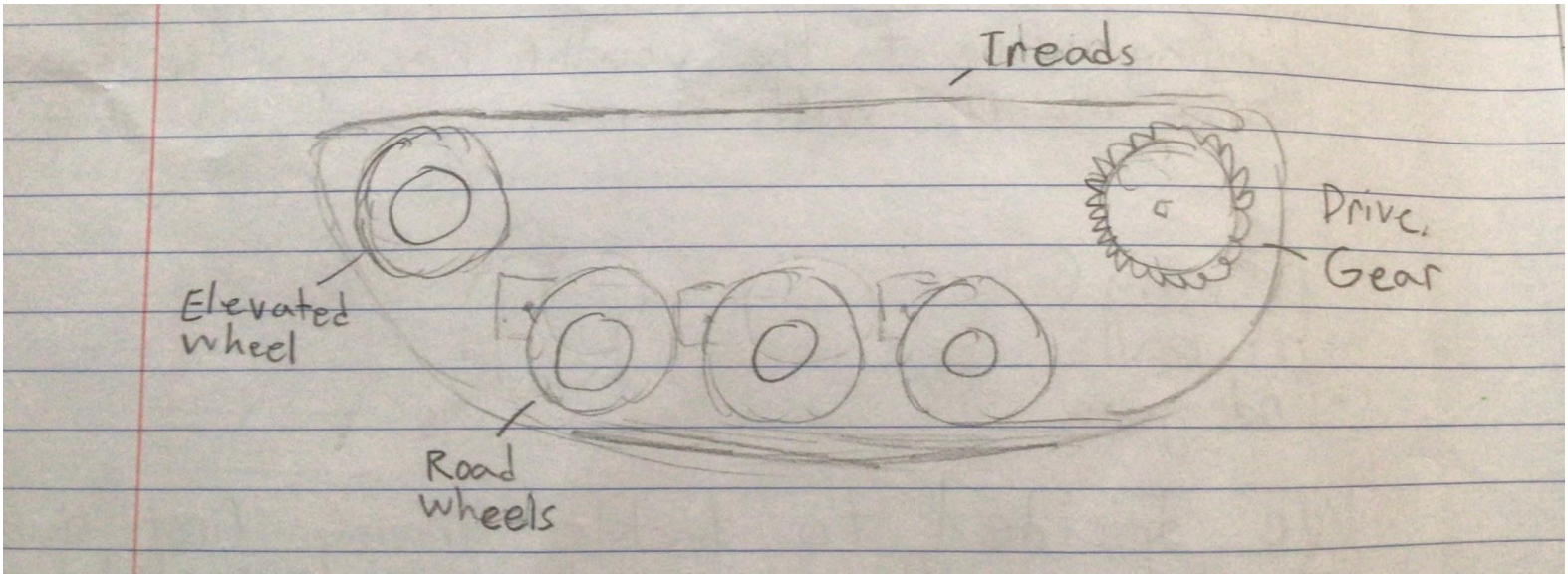
wheel

We decided that the tank treads would be the most effective at getting over the divider so we began research on how tanks drive.

The group watched the YouTube video “How does a tank work?” (M1A2 Abrams) by Jared Owen.

First Day pt2

With the information gathered we sketched out a simple design of what to build and got to building.



A motor would be placed only on the gear which was deemed too slow so we decided to shift over to the 4 wheel drive option instead. We were able to swiftly make a simple first attempt at the idea, constructing a crude model. The robot used 4 inch wheels to try and get over the 3 inch pipe. Unfortunately we ran out of time before testing out the robot.

Coding

Today Zevi and Harry quickly finished the code to run the robot with a controller.
We tested to see if the robot could drive over the 3 inch pipe. 4 trials were run and every attempt was successful

We also made a edit of cool bot
https://drive.google.com/file/d/1Mc7vRAyC5KqmsrpQsl2Pm9SvKR3hWl0Q/view?usp=drivesdk
That's the link of it

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Coolbot Planning

Attendance: Brian Harry Jeremy Kenan Zevi Henry

Today we began by deconstructing the old bot to start making a more improved model. We've named this robot Cool Bot. In addition to the Cool Bot we've began construction on a second robot titled Chillin. This is so we can test out different game metals and determine what works best for us. Henry is currently trying to make a 6 wheel drive train for Chillin.

Improvements to make to the Cool Bot.
The wheels spin at 200 RPM. We want to switch to a blue motor for 600 RPM.

The base needs to be bigger to be able to contain more attachments.

The base requires more support

Wheel guards

5/9

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Coolbot friction reduction

Attendance: Harry, Jeremy

The coolbot had a problem with its wheels. When driving the cool bot it would always tilt to the left. After manually spinning the wheels we realized that the left wheels had to much friction. We loosened the frame and saw very little improvements. We then tried changing the spacers between the wheels and the friction was reduced greatly.

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Science fair

Attendance: Kenan, Harry, Brian, Henry, Til, Jermey, Zevi.

We have decided to take our 2023 vex spin up robot and bring it to our school science fair, we made a poster and a video about our robot. We got the Award and had a really good time all together

Here is the video
https://drive.google.com/file/d/1zGDq2O0WSBbeO4hiLIOzfuVD3DDchirA/view?usp=drivesdk

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Field, Time Management

Attendance: Brian, Harry, Henry, Jeremy, Kenan, Til, Zevi

Today our team met up for two reasons. The first was to assemble the recently obtained field parts. The second was to discuss our time management.

Field

Given the limited space of our work environment we decided to create a smaller verisimilitude of the arena. It will consist of a 4x4 tile floor and 1 goal. In addition we will include the pvc barrier/endgame, and 2 match load zones.

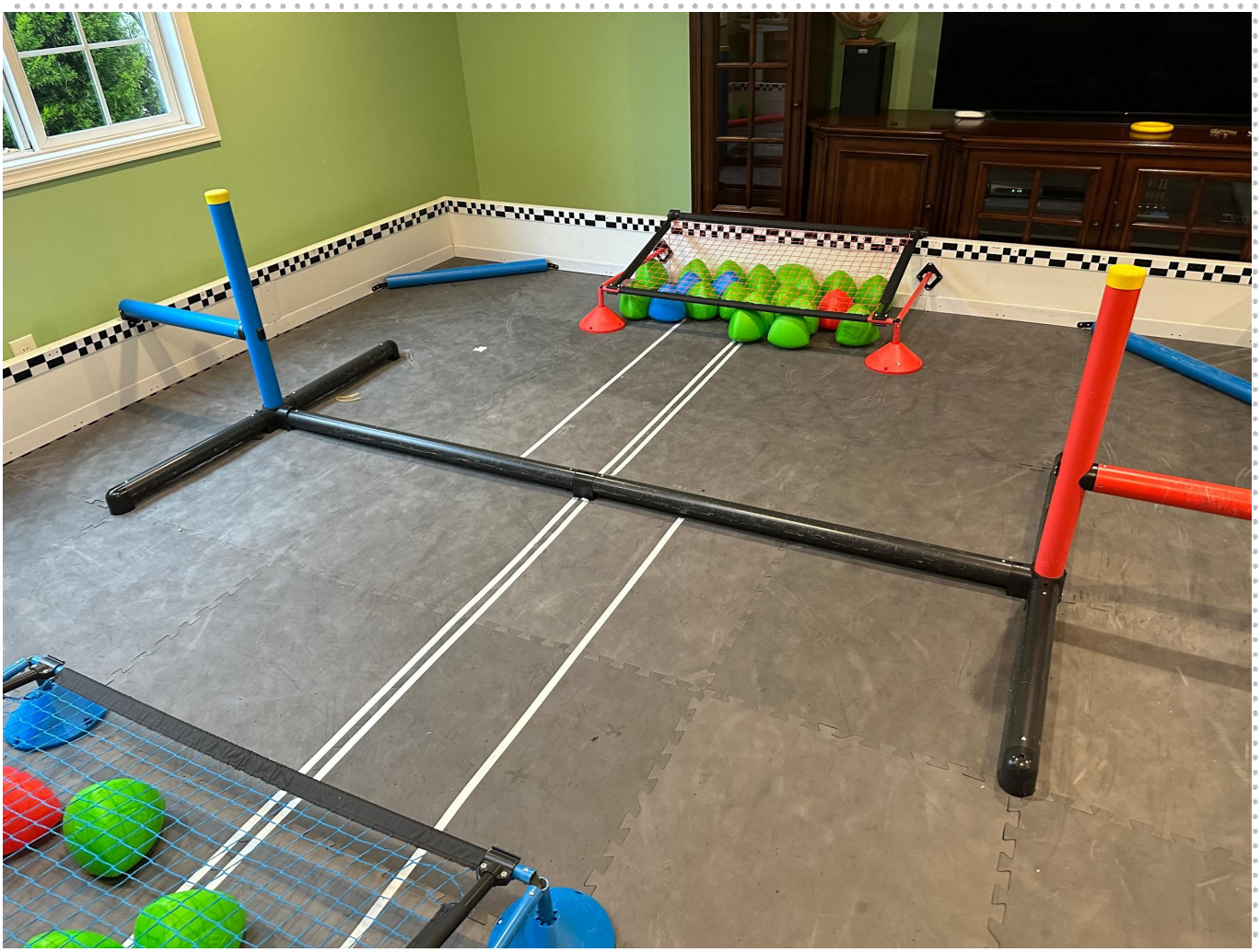
Time

We have concluded that we aren't quite efficient enough. To help with this. We decided to establish a goal for next month. We have decided to finish the first model of the Coolbot. The first model must include a way to deal with all game elements.

Field construction

Attendance: Harry, Henry, Kenan

Our coach has granted us permission to begin construction on a full sized field in his living room. We promptly deconstructed any previous progress made on our last field. We layer down the tiles and set up the perimeter. After a short rest we finished setting up the rest of the field.



Cleaning/organizing

Attendance: Brian Harry Henry Jeremy Zevi

Today Harry told us to clean the workshop. This included reorganizing the bins and cleaning the floors. We now have bins for the following items.

-Gears
-C Channels/axles
-Drive train
-Flex Wheels
-motors/batteries
-neaumatics material
-cables
-tools

Additionally we used smaller bins for smaller pieces. These pieces include

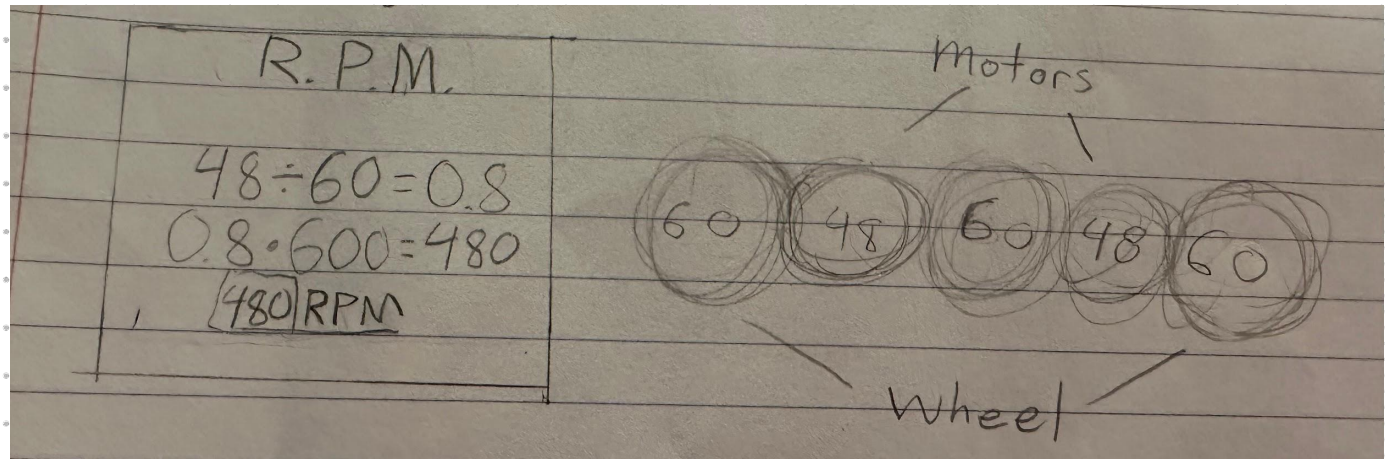
-lockers
-screws
-nuts
-spacers
-zip ties
-rubber bands
-wires

Cool bot 2.0

Attendance: Harry Jeremey Kenan

We began by fully disassembling the Cool Bot and began to work on the Cool Bot 2.0. We started with the drivetrain, deciding that it would be a four-wheel-drive. We wanted the robot to have large wheels that were spaced close together. Because of this, we selected 4 inch wheels.

We will be using blue motors. We decided that we wanted 480 RPM. To accomplish this we decided on a 48 to 60 gear ratio. This also helps minimize the size of the gears as they are only 2 to 2 1/2 inches long.



We gathered the necessary parts for construction and assembled the gears, motors, and c channels.

Cool Robot 2.0 Drivetrain Construction PT1

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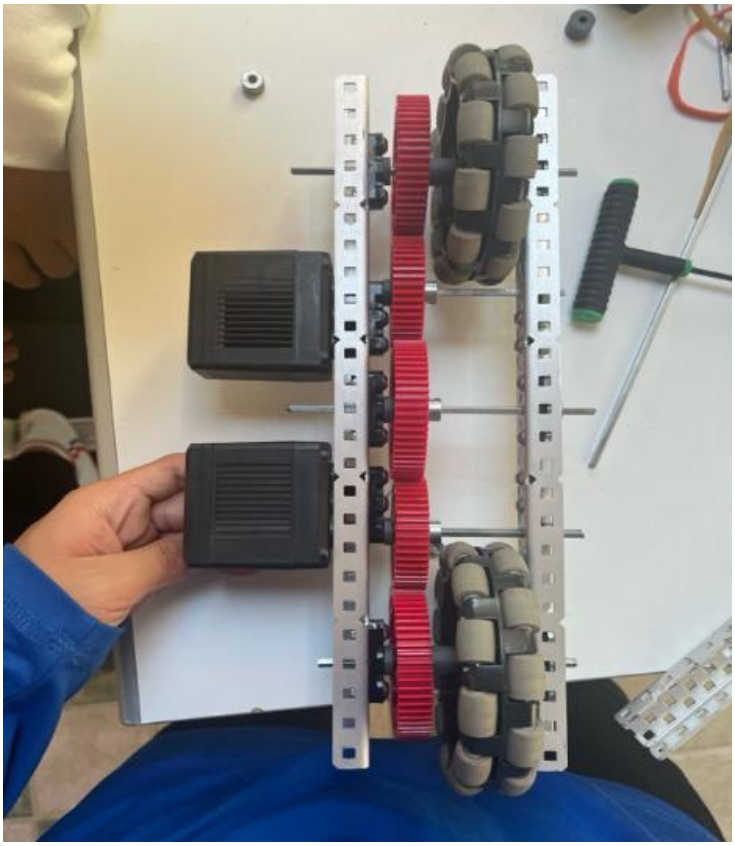
Cool Robot Construction PT2

Page 17

Attendance: Brian Harry Henry Kenan Zevi Jeremy

Goals for today: Finish Drivetrain.
We started out by following the plan from yesterday attaching wheels and a protective outer C Channel. The C Channel was too short being 25 segments. The wheel would hit the second and 4th Axel. We transferred the entire build to a 35 segment c-channel. This change also allows the placement of c channels on the ends.

After a long grind we finished assembling the drive train and found multiple faults in our build.



Problems:
-The motors are not easily replaceable as they are placed to close together.
-The drivetrain alone is far too heavy.
-There is an excessive and uneven amount of spacers.

Conclusion: We have decided on scraping the drivetrain for one last rush job. After searching for a little bit Harry found the video titled 1095R Drivebase Reveal IVRC Over Under by 1095R Run It Back. We decided to base our build off the drive base in the video.

Cool Robot 2.0 Drivetrain Construction PT2

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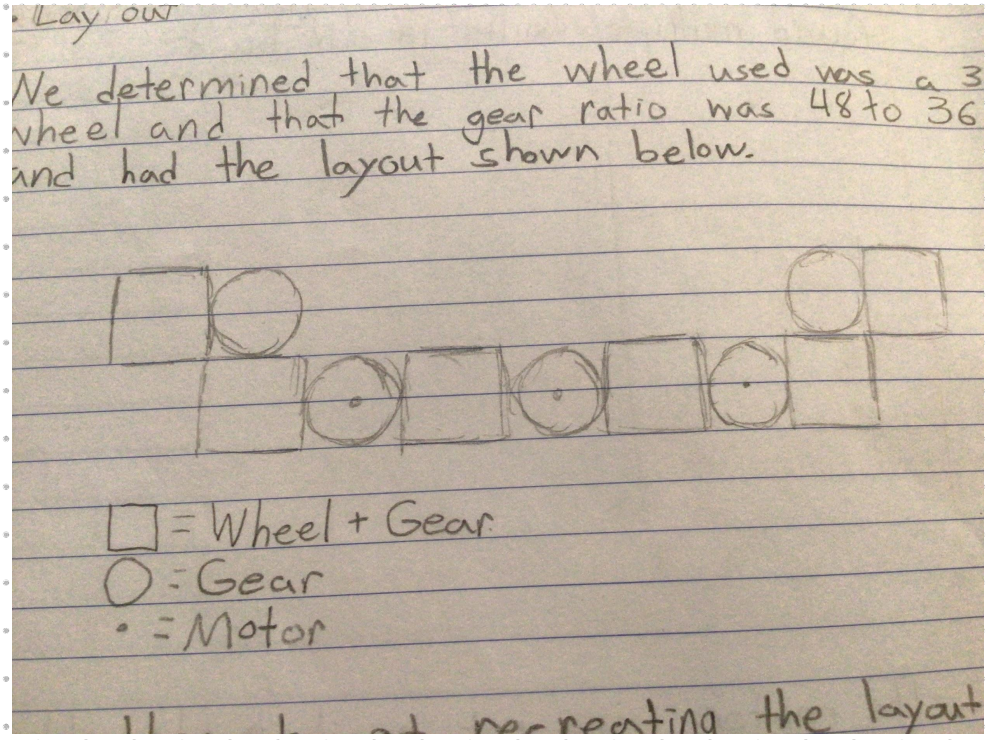
Things to figure out
-Gear Ratio
-Wheel Size
-Layout

We determined that the wheel used was a 3 inch wheel and that the gear ratio was 48 to 36 and had the layout shown below.

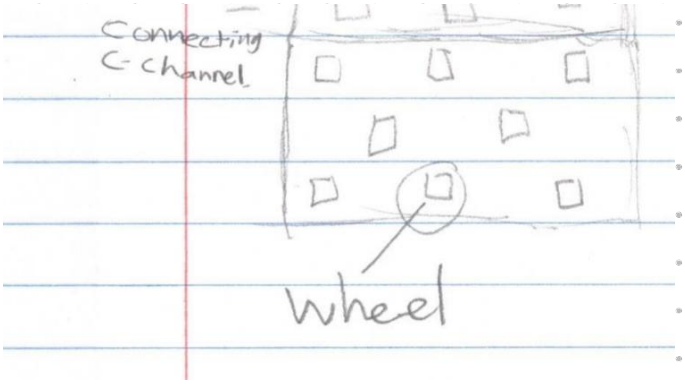


An attempt at re-creating the layout ended in failure. Everyone promptly departed.

C.B.2 Drive train construction

Attendance: Brian, Henry, Jeremy

We duplicated the first half of the drive train ride, and Henry and Brian then proceeded to connect the two via C channel due to the wheel being off-center to the C channel we placed the connecting C channel on the opposite side. This allowed more of the wheel to stay on the field.



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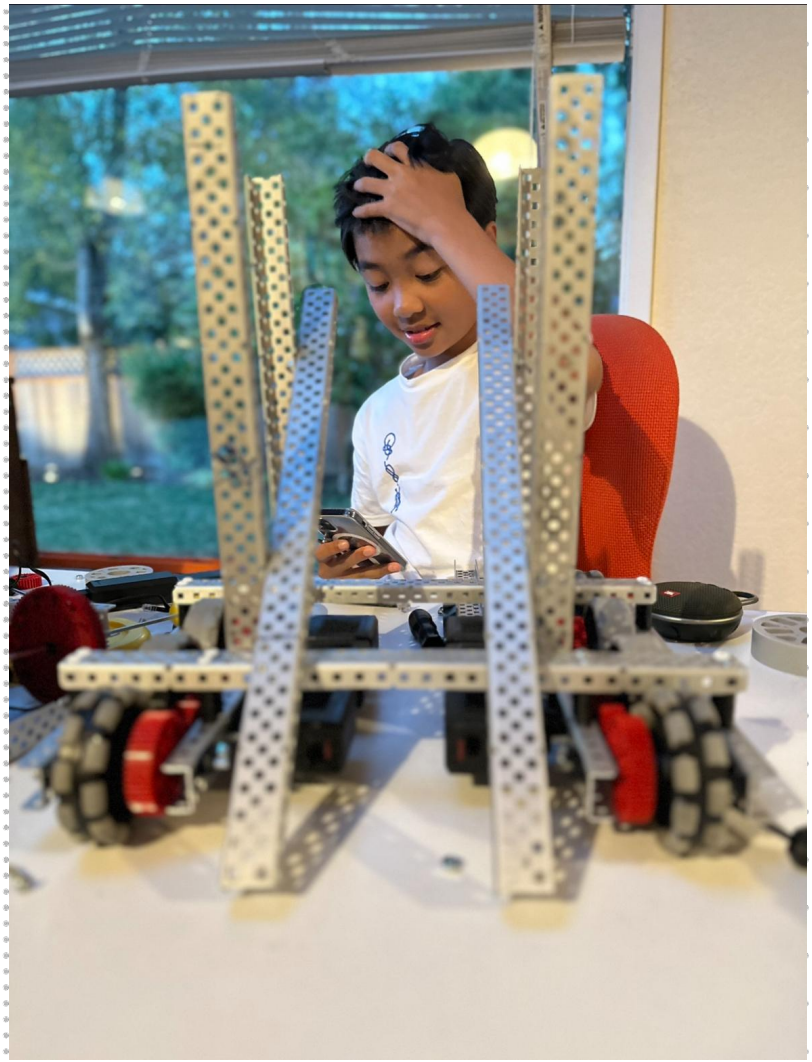
Drivetrain one completed

Attendance: Brian harry Jeremy

Today we continue to work on our drive train. We started off with the motor placement on the C channel this was followed by the placement of gears and add more to the further development of the robot.



Drivetrain 2 planning

Attendance: harry, Henry, Jeremy, til

After a summer Hiatus the group return to work. We scrap the tank drivetrain and opted for a simple, 8 Wheel Dr. train with a 36 to 48 gear ratio. The rpm of the wheels is 450 rebuild the 2 halves and will and then began assembling them

Drivetrain 2 construction

We began work on connecting the 2 halves of the drivetrain. We came up with two options for connecting the hales

Option 1: We could connect it in the middle with 2 c channels.

Option 2:. We could connect it on the endswith 2 c channels

We decided on option 2 as it provided more security and room in the center. As we began attaching we realized that one half of the gearboxes were upside down. We then proceeded to spend the rest of our time correcting this error.

“Catapult 1” planning, endgame research, “intake 1 sensors”

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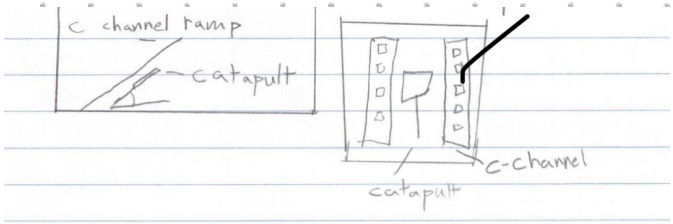
Catapult 1” planning, endgame research, “intake 1 sensors” pt2

Attendance: til, kenan, brian, zevi, henry, harry

Today started out with distribution of roles

People	Roles
Brian Henry	Catapult
Harry Til Kenan	Intake
Zevi	Sensor
Jeremy	Endgame

The catapult in the intake team decided to build an intake that has the catapult in between it.



The catapult team watched vex spin up catapult videos for the ideas on what to build. At the end of session they had concluded that none of the ideas they found were good and would continue the search tomorrow.

The intake team built the base of their build.

The sensor team confirmed that our sensors are working.

“Catapult 1” planning, endgame research, “intake 1 sensors” Pt2

The endgame team found two ideas for the end game

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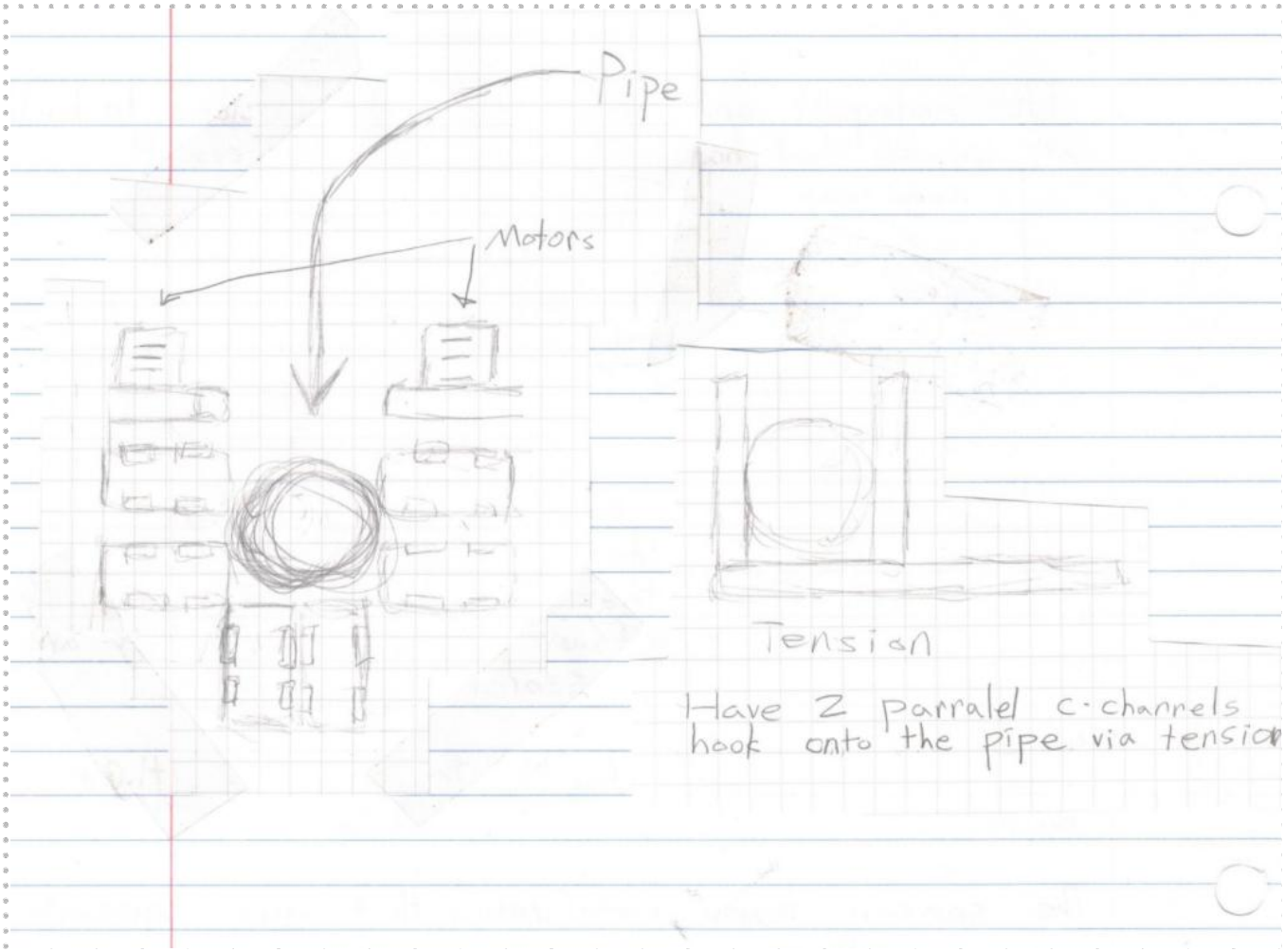
A
simple tension base design with the robot acting as counter weight

B climbing via wheels



“Catapult 1” graphing “Catapult 1” graphing

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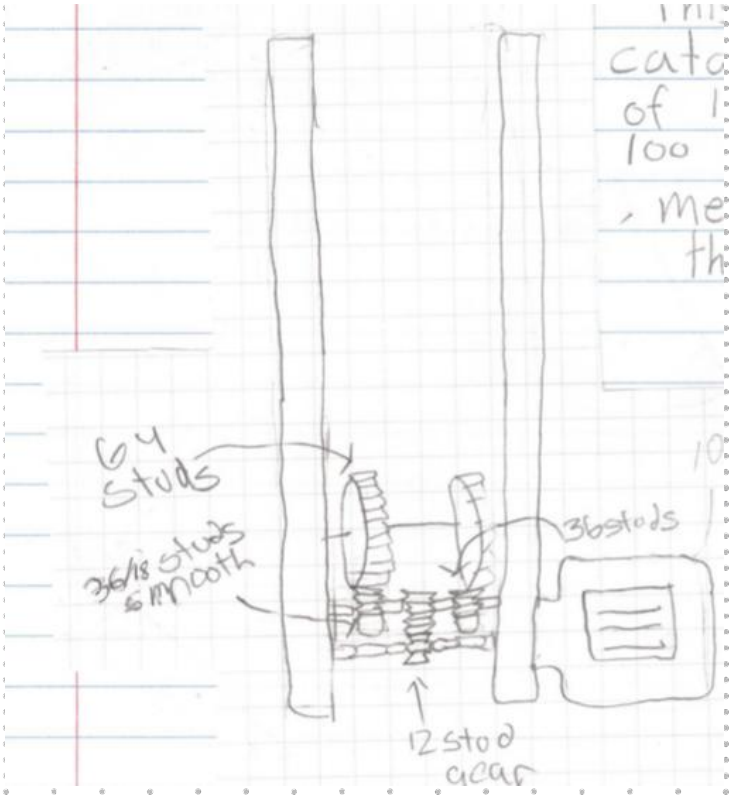
Attendance : Til, Harry, Kenan, Zevi, Henry

Today the cata team found a design for the catapult.



This is the first part of the catapult. It has a Gear ratio of 12 to 36 to 64. The motor spins at 100 RPM. The launching mechanism all relies on the 36 studded gears as we have sanded half of the gear studs away. This will give the 64 studded gears nothing to hook on to, thus launching the catapult.

“Catapult 1” construction

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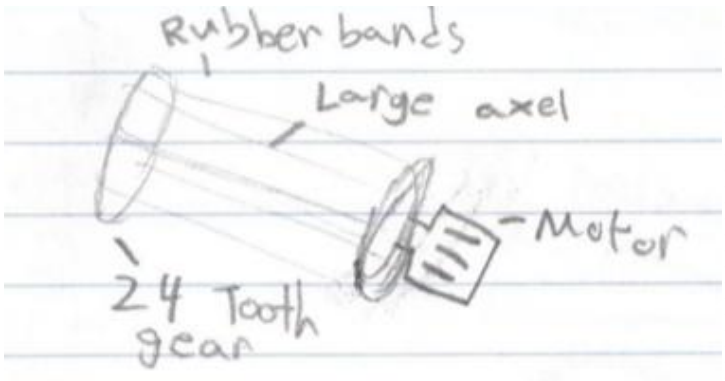
Attendance: Harry Henry Jeremy Til Zevi

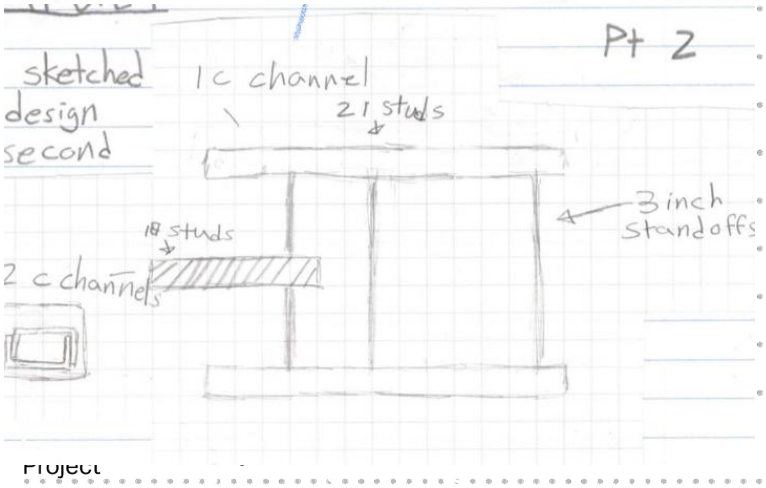
Objectives: Finish catapult, design intake.

We began today by establishing goals and assigning roles.

Harry, Til: Intake research.
Henry: Catapult
Jeremy: Notebook
Zevi: Website

The intake team settled on a design similar to 21417A’s intake.





Catapult!!

Henry sketched out the design for the second part of the robot. This
part will hold the triballs.

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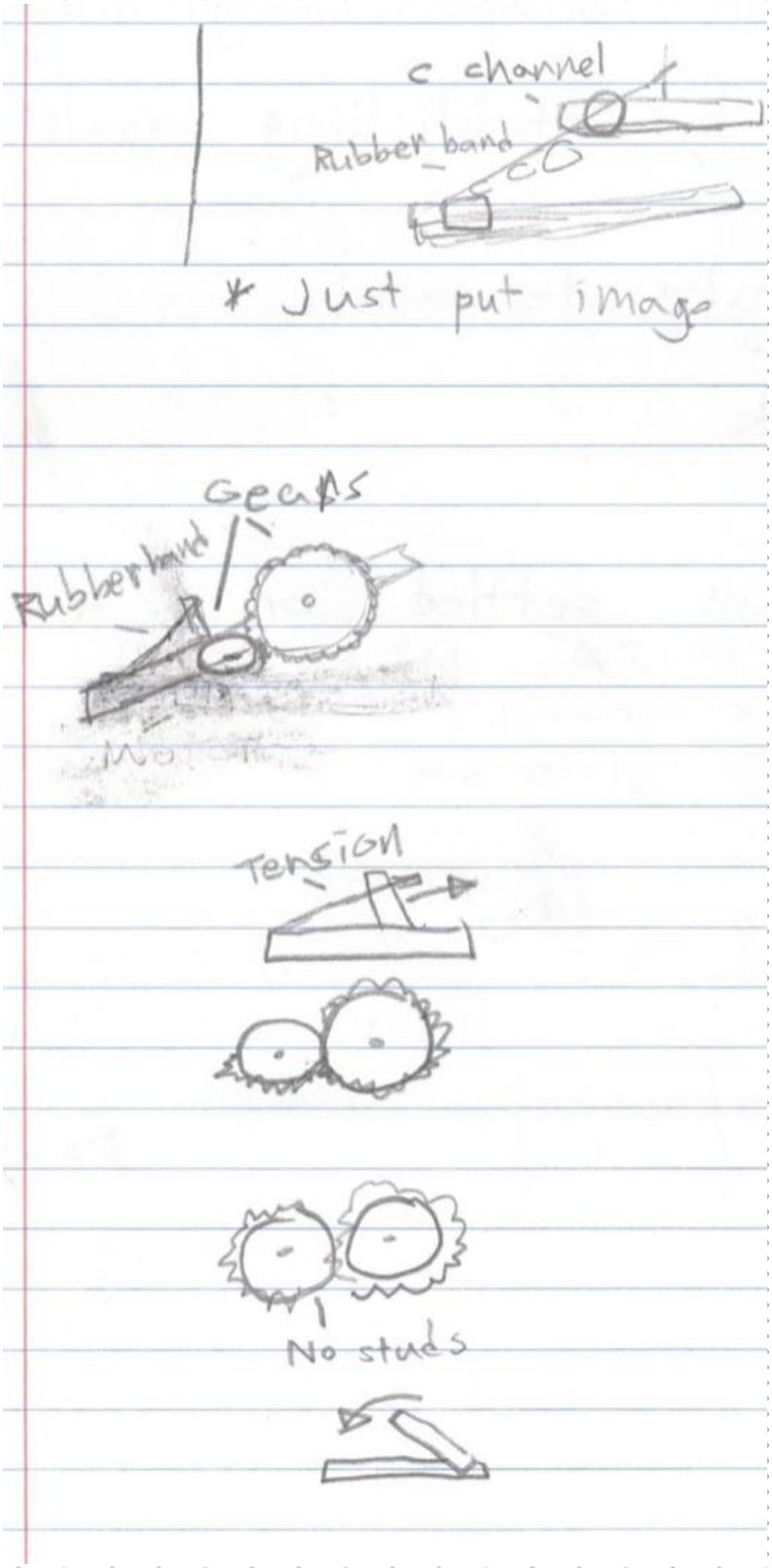

We first assembled the area highlighted, since it was the part that assembles the two parts together. The c channel is connected to the 64th gear. The 64 gear pulls the c channel back which causes tension in the rubber band. As the 64 gear spins along the 36 gear, it'll hit the sanded part. With nothing to latch onto the rubber band is able to release the C channel swiftly, flicking it forward. We tested it five times and guaranteed it works.

Catapult 1” assembly

Attendance: Harry Henry Jeremy Kenan

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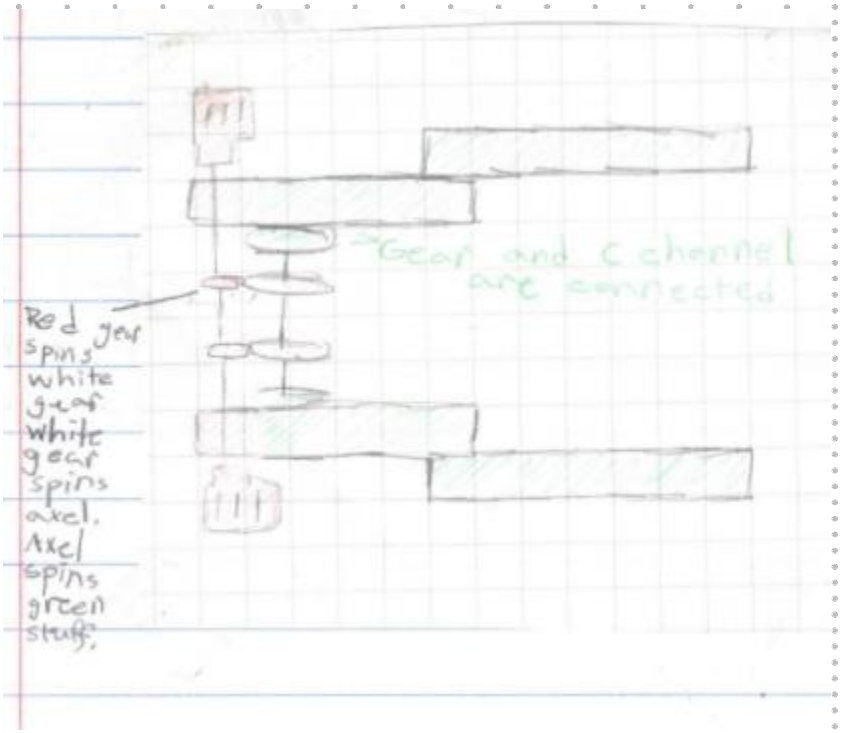
Click for Pt2

Agenda: Finish up catapult attach intake to robot and prepare for competition.

Catapult: As we began to attach the parts to make the tribal holder, we realised that the current system had too much friction. This would cause the rate of fire to gradually slow down overtime. We chose to scrap the current catapult, and begin work on a new one period this design is based off of the design, seen in the YouTube video to “21417A Over Under Early-Season Robot Explanation” by Robokauz, Robotics.



We have chosen to split the build into two parts to make it easier to build.

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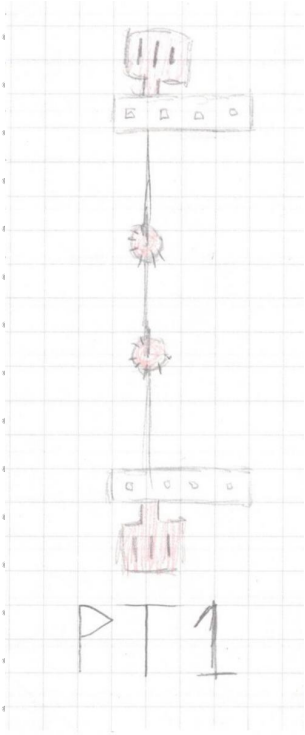
In the first part of the build, two parts are modified.Two 12 studded gears, both having 6 shaved off.
We use these for a slip gear with our catapult. 2 Motors power the catapult at 200 RPM.



Competition Preparation

Our coach has us scheduled to attend a competition in Vancouver, BC. The competition will be held on the 27th of August. One of our preparations is to halt work on our intake mechanism. This is because of two reasons. The first is so we can focus all of our effort into the catapult. The second is because we do not believe that our team can successfully finish the intake due to the rate of which our team is working.

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NOTICE

From here on in the book the notebook will have a different formatting and a 2 month gap in the notebook. This is due to our team undergoing a heavy revision. These include role changes, room set up, notebook formatting and contact methods. Additionaly in these two months we made a compete revision of the robot which I will try to cover in the next few pages.these pages will be indicated by a red dot in the upper left corner of the page.

Role Changes

We changed roles as we noticed some members weren't given enough opportunity to participate so we switched up the roles and created new ones. The jobs are listed below.

- Henry - Builder
- Brian - Builder
- Till - Cad Modeler
- Kenan - Cad Modeler/notbooker
- Harry - Driver/Captain
- Zevi - Coder
- Jeremy - Notebooker

*The cad modelers will be used to better help our design process and allow better documentation.

Two Month Gap

Our notebook had many faults and gaps due to it being the job of one man. This is simply because the job was left to one man and lacked cooperation from the whole team. Initially we intended to simulate a real work environment by having the builders the coder and the designers all working together to document their daily work. Unfortunately this plan fell threw due to a lack of time. Currently the team has appointed me as the main notebooker until they can find a way too practically share the responsibility.

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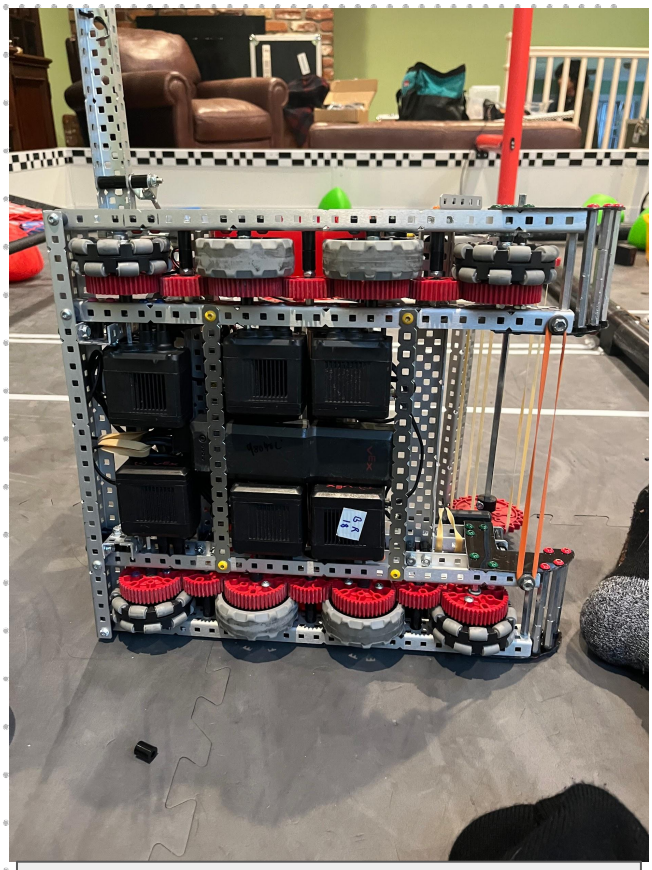
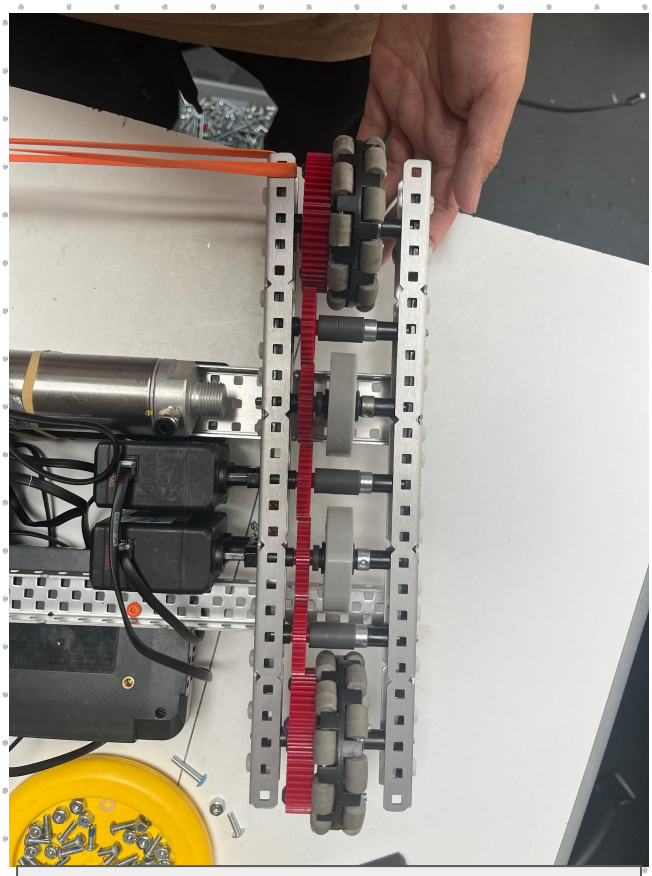
Drivetrain

Our current Drive Train is a 6 motor drivetrain that has direct connects to blue motors, making the drivetrain run at 600 rpm. We chose this because we noticed that on our last robot, which was 400 rpm, we didn't really ever push bots while pushing in tribals, so we didn't really need a lot of torque. Because of this we decided to go with a faster drive to be able to move around the field faster



Current Drive Train



Old Drive Train

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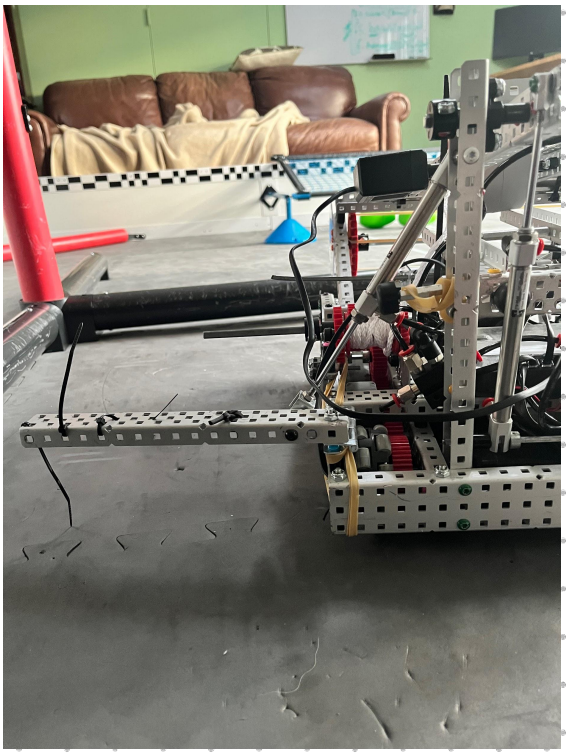
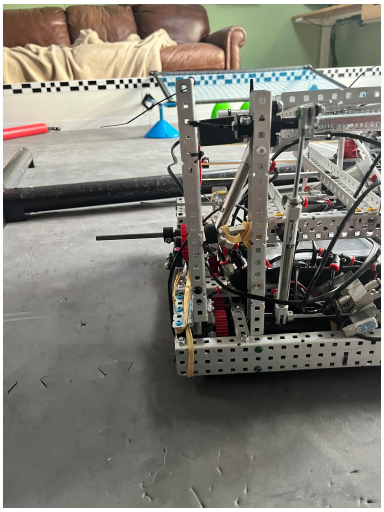
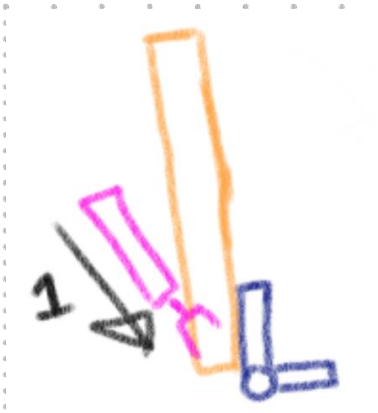
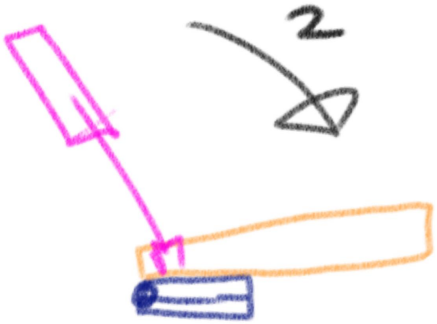
Wings

On our robot we currently have two vertical wings. There is one c channel for each wing, connected to a piston that we screwed into the bars we have to support our flywheel lift. The reason we have vertical wings is because they are much stronger than horizontal wings. This is because we use hinges for the wings. What they do is lock the wings when their down, making them very strong and good for pushing in triballs.









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Matchloads/Launcher

The plan at the beginning was to make a “kicker”. It’s a small mechanism that essentially would kick the balls. The ultimate reason for choosing the kicker would’ve been to attach it to the top of an endgame mechanism. We decided to go with a flywheel instead because it match loads as fast as you can put the balls on, making it faster in matches and skills. It spins at 3000 rpm and is geared by a 1:5 gear ratio connected to 600 rpm motor. We lift it using a 2 bar mech connected to pistons, to push the 2 bar up and down.

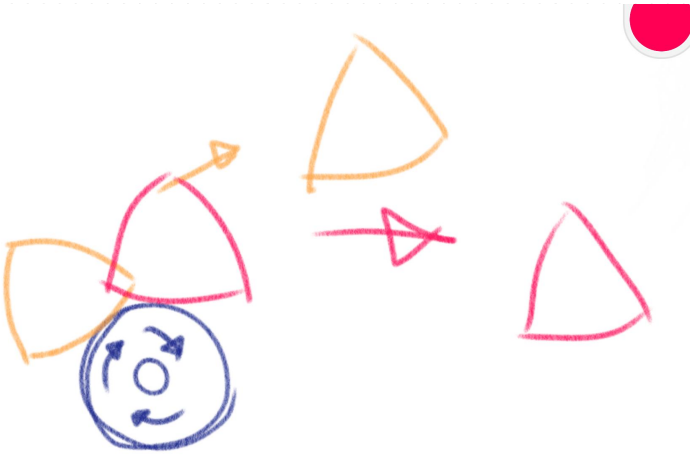
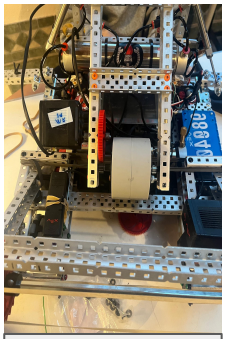
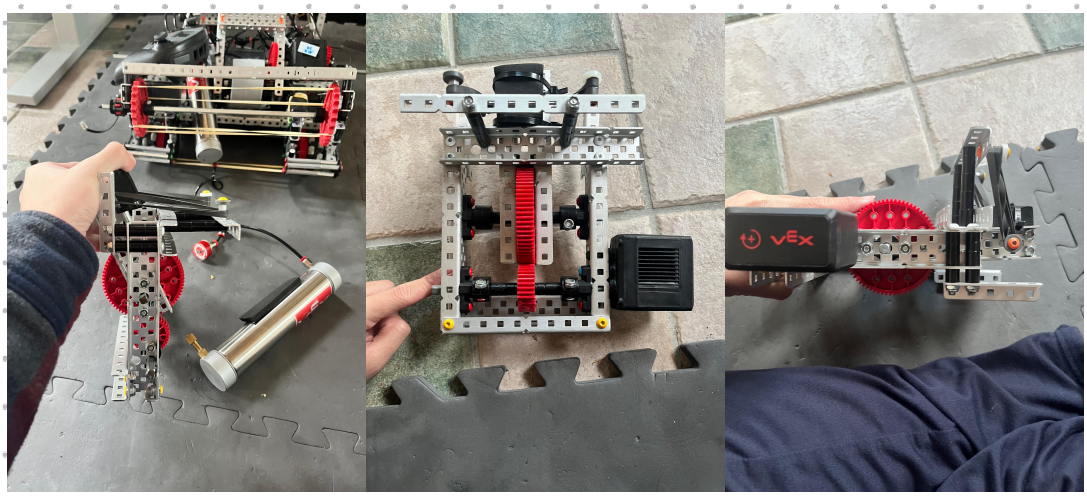


Diagram of Triball Placements



Flywheel



Current Kicker Progress

Blaze Skirmish

Back to table of contents Pt 2

Today we had a scrimmage at the blaze organization. This gave us the opportunity to see ho performs. We played 2 matches and won both of them. Additionally we ran one skills run. Un couldn't find the match's info on vex via but I will give a brief summary on each match.

Match 1

- It started off bad and we were down over 20 points
- We ended up losing BUT we redid the game due to the fact that the field was broken a affecting.
- in the redo round we were off to a good start up by 30
- After all of the struggles we ended up winning 90 to 65

Match 2

- We went into this match confident and ready to try our endgame
- It started of nice and easy the match loading was quick and efficient
- We were up by so much and pushed a whole 7 tribals in 5 seconds
- And from now it was just smooth sailing and it turned into a win

Skills Manual

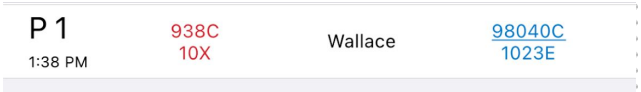
- We having been running trials of skills
- We average about 100 to 110
- going into this was right after our matches so the cats was burned out
- we had no choice to we started
- And failed with a score of 81

Ignite the Northwest
Day 1

Ignite the Northwest is our first ever signature event as a team, it is great experience for us to look at other teams, and improve our own robot. The first portion of the day was spent in the opening ceremony and just to get to know the other teams around us.

Match Summaries

Before the qualification matches started in the afternoon we had one practice match, we used this opportunity to prepare for the important matches We also used these practice matches to observe the best teams and to study their game strategy, which is just as important as having good robots. We found out the Bowling, where you just put the tribals on the side, was used more than your standard match loading, this is because when you bowl you have better control over the ball, rather than having your match loads go all over the place, which results in the opponent scoring. This match would be the first match in the entire event, with Us and 1023E against 10x and 938c, after a hard-fought match, we ended up coming out on top.



After a few more practice matches it was time for our first match, it was 98040c and 10012g against 938U and 502A. This match seemed like it was an easy win, but it ended up being way closer than expected, the opponents played heavy defense, and we put the bowling technique to the test, it worked as we managed to score a few tribals. This match was crazy as we lost in the autonomous period while our opponents were just so good at defense, we ended up coming out on top, 59-42 while taking home a win point.

We were all very excited because since we placed high because we got the winning point and won, we were in 10th place, this 2nd match was our last match for the day and we wanted to be placed high at the end, so we knew we had to win, it was 98040c and 1687c against 8675v and 46874J. This was one of the funniest matches because the crowds for both sides were seeing how loud they could cheer, but in the actual match, we decided to all just match load. Both teams used all 22 match loads within the first 30 seconds, it was mayhem because tribals were everywhere, after the majority were scored it was all down to the final few which we battled for, ramming each other. We ended up stealing 2 extra tribals in the corner bringing us the win, 134 to 128.

Ignite the Northwest
Day 2

The second day was made up of mostly qualification matches, we had 5 matches today, but before the matches started we decided to run auton skills which we achieved 91, bringing our total to 265, which puts us at 77th in the world for middle school.

Match Summaries

Our first match of the day was with 938x, we were fairly confident that we would win, we were supposed to play defense this match, but we ended up playing offense. 938x was supposed to bowl the whole match, but they messed up with match loading, and out of the 8 balls they match loaded they let the opponent score 4 and they only scored 4. We went over the matchload at the end, but we kept running into X, and we ended up losing 89 to 86. We definitely could have done a better job at communicating, because if X had managed to hang or we managed to get 2 more balls across we would have won, and those only needed a extra second, which was lost when we kept running into X.

At this point we lost some motivation because we thought our previous match would be a easy win. We knew that we had to win this match, we are up against 2 sister teams 99621C and 99621A, we were allied with a team that has a 329 skills score. This seemed like it would be a easy match, but it ended up being way close than we expected. We were bowling the entire time, scoring loads of tri-balls unopposed, but the managed to slip past our teammate who was playing defense and even the score by a bit. We ended up winning 125-112, something we could focus more on in this match would be bowling 3-4 instead of 1-2 each time.

Going into the 5th match of the tournament hopes were low as we were not expecting to win against 652A robot monkeys, this is because they have such a good robot, and they won excellence at the world championship last year. The game plan was just to play heavy defense on them and prevent them from scoring. Their teammate couldn't do much, so if we just stopped them from scoring it would be an easy win right?, Wrong. We got destroyed 80-123, this is because the robot can just outrun us so even when both bots are playing defense they just slip past and score. Something we learned from this game is that maybe a light and simple robot is better than a heavy and complex one, we will focus more on that for our next rebuild.

Ignite the Northwest
Day 2

Judging

While waiting for one of our matches, we were practicing our presentation and explanation because we knew that the judges were going to come to our table sooner or later. As we were finishing up our first practice round, 2 judges approached us and asked if this was a good time for a interview, we agreed and started to answer the questions. This included the code, explaining the robot, explaining the design process and trials and failures, each one of us played our part, and the judges walked away impressed.

Ignite the northwest day 3

Intro:

Going into the third day we new that this day is the on that counted we had two games before elimination rounds for the first game to start of the third day we were paired with 5327K they are a good team with a B tear endgame. We were against some strong opponents though including 609A and 6526D the outcome that we saw was crazy 80 to 80 a solid tie which happens very rarely. Next it was alliance selection and we choose 10x because of their amazing defensive skill and their good endgame. It was elimination round now and this is where it started getting serious for us we were going up against 10012G and 9364C. The math started off intense we started bowling and some tribals fell on the opponent's side not off to a good start but we bounced back pushing in many tribals but that was not enough as we lost 168-100. In summary it was not our brightest competition but we still fought through it. A couple problems to take away it the weight of our robot it is so heavy we can even get over the border nonetheless endgame is almost useless as our hang is A tier at best if it works so we are going to choose to rebuild

January 16th 2024

Project

Name Date Page

1/16/2024

Attendance: Full house: Harry, Henry, Kenan, Till, Brian, Jeremy, Zevi

Topic:

Our new robot, Penguini, building started today, the robot is our fourth rebuild this year. Our goals for this new robot are:

1. Light, preferably 10 - 12 pounds
2. At least C-tier hang, we have achieved B hang
3. Use a slapper to matchload tri-balls
4. An intake without exposed rubber bands

WHAT WE DID TODAY:

After our team huddle and discussion, we decided that the best course of action before the following competition was to:

1. Get AWP on our old robot
2. Get at least a 3 ball auton
3. Start our new robot(Penguini)
4. Dismantle Endgame as it did not currently work and just wasted space
5. Record events and problems in notebook

Our idea for Penguini's drivetrain is:

- A 450 rpm drive speed(36:48 gear ratio)
- Wheels mounted by screw joints
- Small 6P gears to save weight and space
- Optimized weight
- 6 motor drive
- Small and compact
- 10 lbs

Reasons for dismantling endgame on old robot:

1. Saves weight
2. Saves space
3. Not worth the the time in match to only achieve high A tier
4. Makes room for smaller easier endgame such as wing endgame

1/16/24

What we did pt2

Zevi got to work working out the kinks of PID and testing on our dummy bot. Meanwhile Harry, Brian got to work building the new robot(Penguini). Henry got to work tearing down the Endgame on our old robot, as it did not currently work and just wasted space. Kenan got to work on Notebook as we are moving the physical version into a digital copy..

Notebook progress after Ignite:

After the sig comp at Washington HQ, Ignite, we learned the importance of the notebook. Previously, our notebook didn't have the quality to compete with other teams at the signature event. We did get lucky though that they didn't ask to much of our notebook and we were able to answer the questions. At that time, our notebook was not up to date and details were scarce, thus, the day after Ignite we decided to change up how notebooking is run and establish some goals moving forward. One of the major changes is who writes in the notebook. From this point on all members will contribute to the notebook, are Kenan and Jeremy.

BUILDING REPORT 1/16/24

*New drivetrain for new robot(*Penguini)

(Perspective of Harry and Brian(The builders)):

We wanted to design a drivetrain for our new robot that followed 3 main criteria:

1. Small, compact, and light
2. 450 RPM to enable precision while driving
3. Screw joints and plastic screws in some areas

First 30 minutes of build:

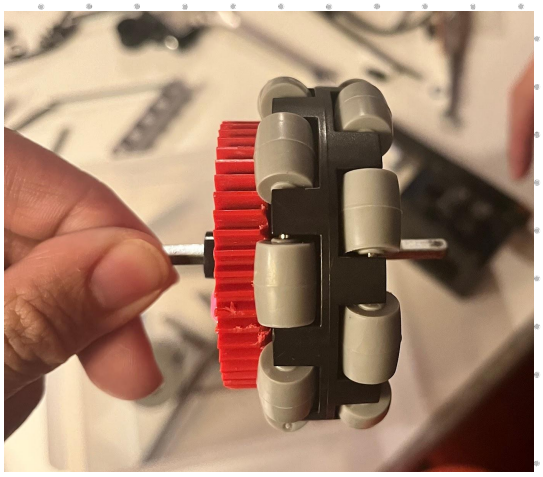
We started off the build by accessing what we had and how we wanted to design our robot. We wanted to make this drivetrain lighter than our previous one, while keeping its while keeping its structure robust and strong. So we

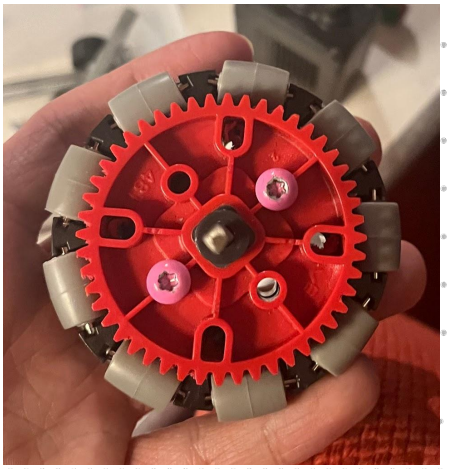
1 hour progress:

At this point we have our basic idea down and we are ready to start building. We swap out green motor cartridges to blue. Then we start putting the motors in and start constructing the screw joints

Last 30 minutes of build:

In order to save space and reduce weight Harry decided to bevel the 48 tooth gears. This also allowed the gear fit into the wheel without making contact with the treads.

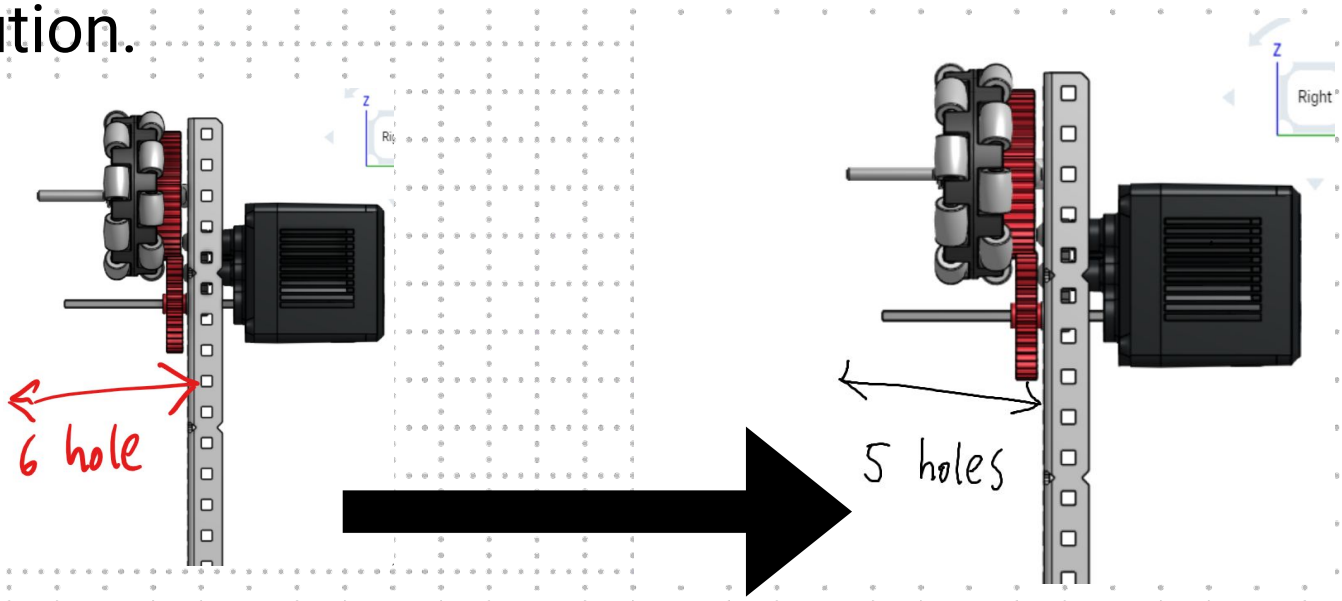




THE PROBLEM WITH THE DRIVETRAIN

1/16/2024

Our goal for our drivetrain, as said before, was to make it small and compact. Therefore, we didn't want to waste even a single centimeter. While building the drivetrain, we encountered an issue. We wanted our drivetrain sides to be 5 holes long, but we couldn't fit all the components within that 5 hole space. If we wanted our drivetrain sides to be 5 holes long, we had to think outside of the box and do something creative. We brainstormed on how to fix this problem. This thinking and designing would continue for the next few days until we thought of a solution.



The image above shows what we wanted versus what most teams and what we previously had

January 17th

2024

Project

Name Date Page

1/17/2024

Attendance: Kenan, Harry, Jeremy

Topic:

1. Our goal for the notebook improvement is reformatting it to a standard vex format and adding links to pages to help the judges navigate the book easier.

WHAT WE DID TODAY:

There was a fairly low attendance today. Kenan worked on adding links to the notebook, as wells as formatting changes. Harry worked on adding more wheels, and figuring out how to save the most weight on the drivetrain.

Notebook Report

Today Kenan decided to add links to the notebook making it easier to get through the slides and see what you need to see.
He also added photos of our team along with notes from our past notebook now moving it into a the digital slides.
The table of contents was freshened up and big progress was made to the notebook in general.

Notebook report

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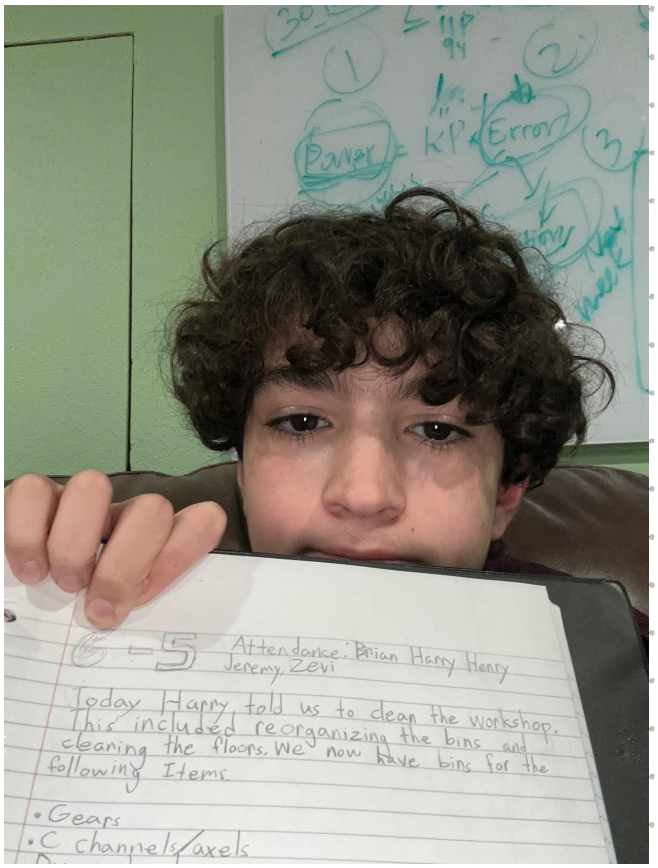


Ignite competition:

Build report 1/17/2024

Many people were busy today so only Harry the builder was here to build today. He brainstormed ways to make the drivetrain fit within the 5 hole constraint. He tried everything, he made the spacers the smallest size and even attempted to shear the gear in half(Which did not work, this would only put the gear closer to the wheel, but then the motor gear would contact the rubber outline of the wheel). The problem remained unsolved and it continued to the next day.

January 18th 2024

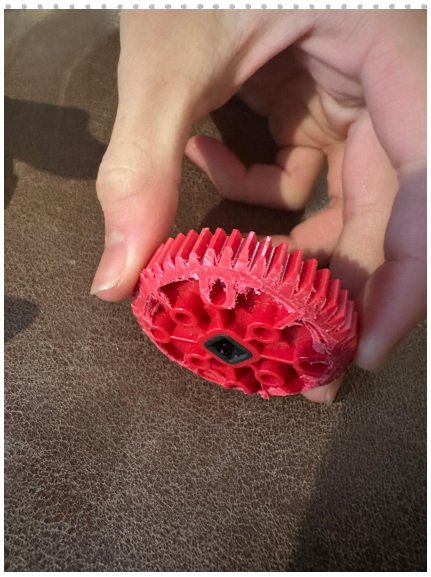
Project

Name Date Page

1-18-24

Attendance: Brian, kenan, Harry, Til, Zevi, Henry, Jeremy

Today we split up into groups to work faster today zevi is working on inertia sensor then harry and Brian are working on drive tain, then til (me), Jeremy, and kenan are working on notebook. For the working on drive train there are going to be a six motor drivetrain and our goal is to optimize and possibly cut gears to make it more efficient for weight and space. we are making and finishing wings. Me and kenan are putting our hard work and time into this notebook as we are submitting on Friday



1/18 2024

Attendance: Kenan, Harry, Jeremy, Brian, Henry, Till, Zevi

Topic for today:

1. Brainstorm ways to fit drivetrain within the 5 hole boundary.
2. Work on finishing up writing down events at the ignite competition from a couple days ago
3. Add another small lightweight wing to our old robot, we only have one
4. Make progress on AWP

WHAT WE DID TODAY:

We managed to figure out a way to fit our drivetrain within 5 holes by going to extreme measures.

We added another wing to our old robot, since we only had one

Our coder made progress on the AWP

We recorded more events from the ignite competition and added them to the notebook.

Some ideas we add for reducing space in the drivetrain sides:

1. Shear the gear (Did not work)
2. Cut off part of the rubber fillings in the wheel to save space(We didn't want to damage the wheel and affect driving performance)
3. Flatten screw heads with grinder to save space (Half solution)
4. Make the drivetrain sides 5 ½ holes instead of just 5 (reject)
5. Go to extreme measures and grind screw tips sticking out.(Will explain in more detail)

Project

Name Date Page

Penguini-Drivetrain wheel model:

Here are our CAD models of our wheels, made in onshape, to model what are wheel looks like

Mass properties

Instances to measure

48T High Strength Gear V2 (276-7573) <1>

2.75" Anti-Static Omni-Directional Wheel (220mm Travel) (276-810...

#8-32 x 1-1/4" Star Drive Screw (276-4997) <1>

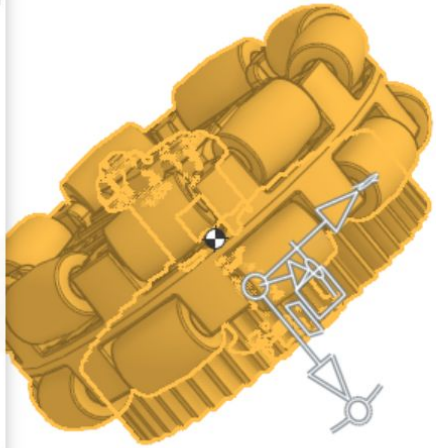
Mate connector for reference frame

Show calculation variance

Mass	Override	0.165 lb
Volume		3.132 in³
Surface area		87.998 in²
Center of mass	Override	
X		-4.639 in
Y		4.12 in
Z		-2.918 in

Mass moments of inertia (in² lb) Override

Lxx	0.082	Lxy	-2.073e-6	Lxz	-4.520e-7
Lyx	-2.073e-6	Lyy	0.133	Lyz	2.808e-6
Lzx	-4.520e-7	Lzy	2.808e-6	Lzz	0.089



Part Studio 3 | Part Studio 2 | Assembly 1 | Assembly 2

Here you can see the weight(mass) and some materials we used for our wheel.

Project

Name Date Page

Build Report:

1/18/2024

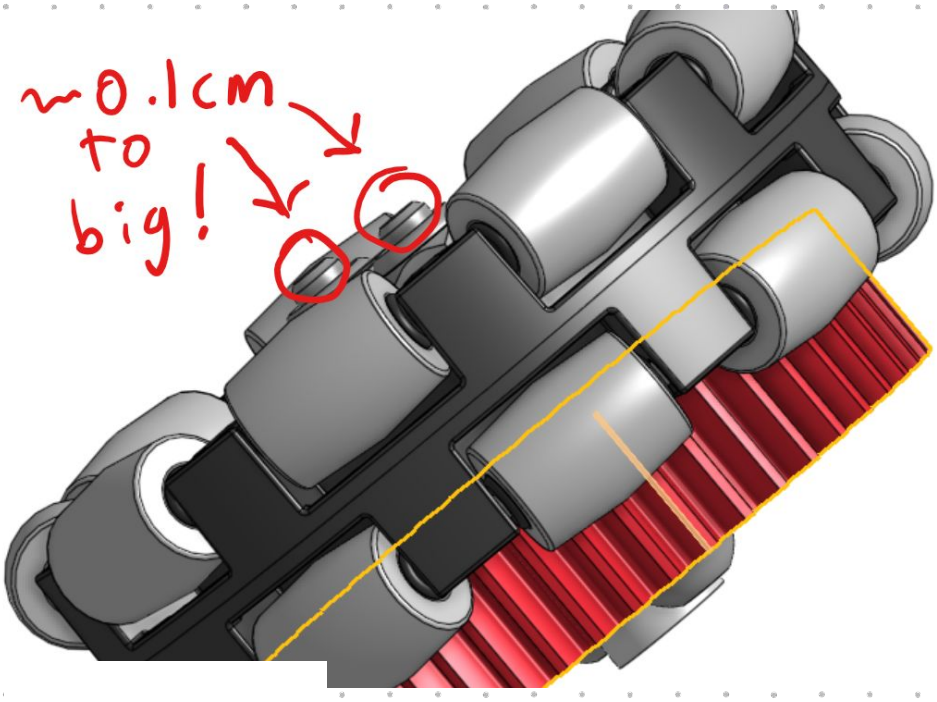
We had been working on the problem of fitting all the contents of our drivetrain within a five hole wide space. We had been brainstorming and testing multiple things, and we eventually came to a solution that worked today. The next few slides will explain how we solved this problem in detail. We also added one more wing to our old robot as we only had one at the time, Henry, our builder also made this model lightweight and incredibly strong

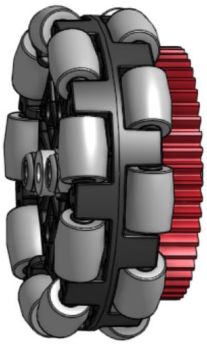
ADDING OF THE WING:

We would like to add the 2nd wing on the other side of our robot to achieve the auto on WP, it was very frustrating because the spacers kept falling out and kept touching the wheel. After figuring out a lighter and better design that still worked we put it on, although it worked, it was affecting the whole structure of the robot. We removed some spacers from the design and then tested them, working perfectly.

Penguini-Drivetrain1 1/18/2024:

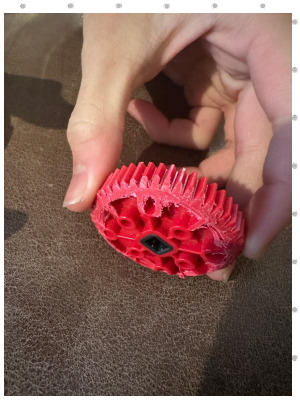
Today we fit all our components of our drivetrain within 5 holes. To do this, we had to shave some screws tips to make them shorter. After we optimized the drivetrain by beveling the gear into the drivetrain and using the smallest possible spacer, we were still a tiny bit bigger than 5 holes. We had two screw tips that stuck out from the wheel that kept hitting the C-Channel, and there was no screw size smaller that fit the requirement. So we grinded the screw until it became shorter. The picture below pictures what it looked like before and after:



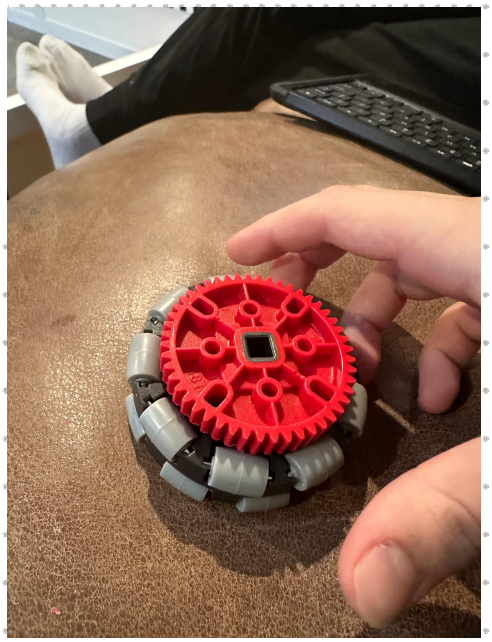


After shaving part of the screw tip, the drivetrain components now fit within the 5 hole goal!

Gears, after beveled



Gear fitting inside wheel:

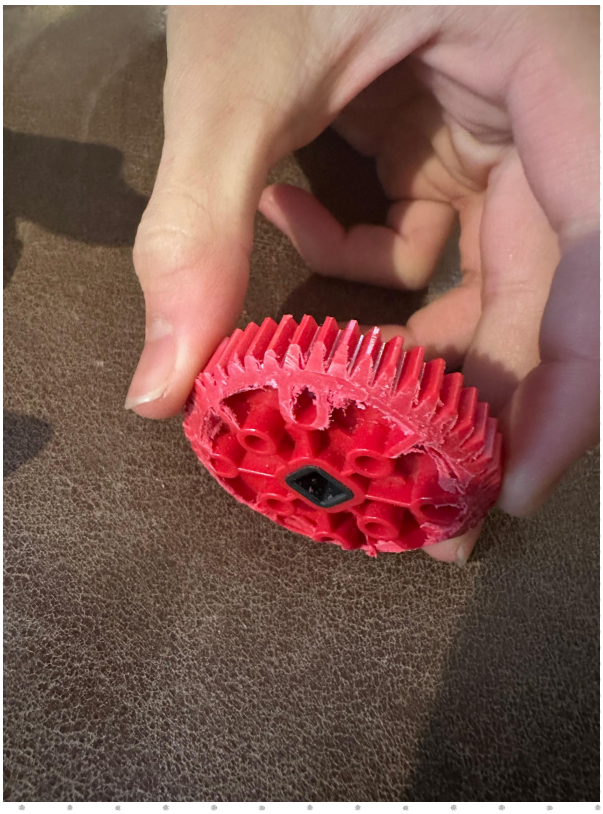


Project

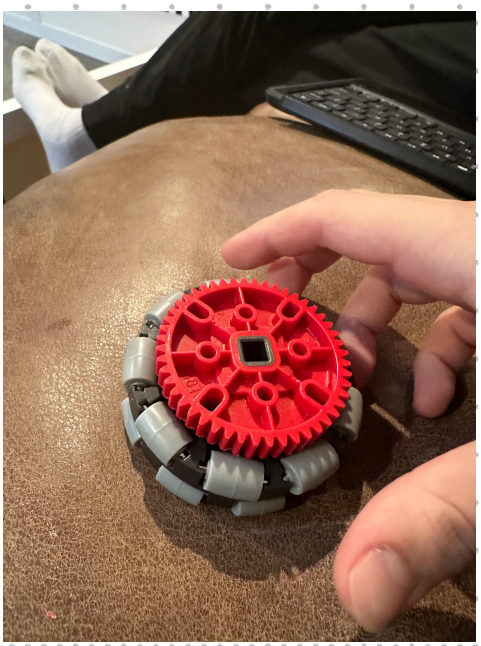
Name Date Page

Photos of the drivetrain components:

Gears, after beveled



Gear fitting inside wheel:



Project

Name Date Page

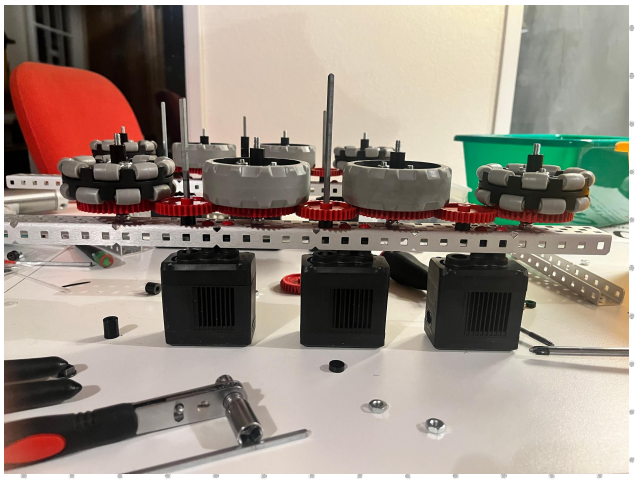
1/20/2024
Attendance: Brian, Harry, Henry, Jeremy, Kenan, Til, Zevi

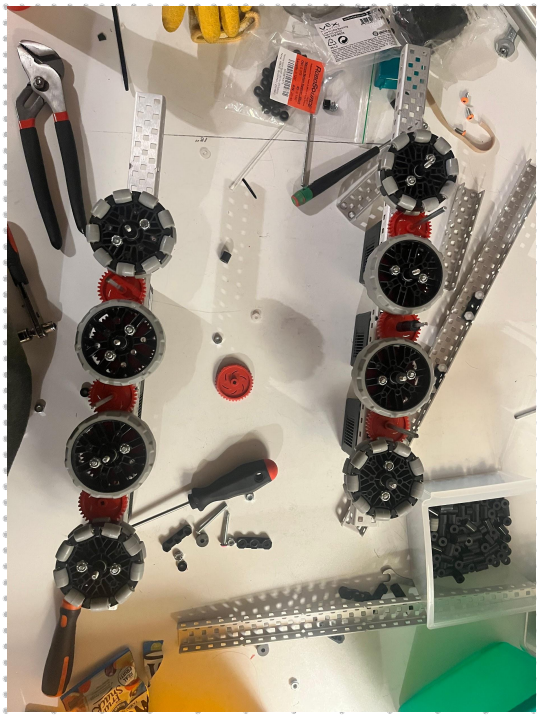
Goals For the Day:

1. Get to the finals of Highland Games.
2. Finish the drivetrain of Penguini

What Got Done:

1. drivetrain halves done-connection needed
2. Made it to the Quarterfinals of the Highland Games





Construction went smoothly without any complications. We have to wait for tomorrow to cut excess parts as there is no one permitted to cut parts at the moment.

Project

Name Jeremy Date Page

Qualifications

Q 5 10:17 AM	98040C 299Y	92	85	90385R 3512E
Q 20 11:22 AM	1023E 99621C	82	58	99621B 98040C
Q 27 11:52 AM	99621M 98040C	74	65	1248X 7784K
Q 41 1:32 PM	99621H 3512D	47	88	98040C 10K
Q 51 2:14 PM	8931M 98040C	71	44	299W 3512C

Our match loader, Jeremy, Leaned too far in during bowling. This resulted in a warning.

Jeremy leaned too far in again. We determined that the bot was too far from the loaders, and that it needed to be driven closer during loading. Additionally Til swapped places with Jeremy for loading.

Qualifications ended with us in 3rd place. Harry chose 10A as our alliance partners because they had the highest skills score.

Project

Name Date Page

BUILDING REPORT 1/21/24

*New drivetrain for new robot(*Penguini)

We wanted to finish up the drivetrain. We also began to make the intake with a few requirements in mind. We wanted it to be:

1. Small, compact, and light
2. Little to no rubber bands as they got caught on other robots
3.

First 30 minutes of build:

1 hour progress:

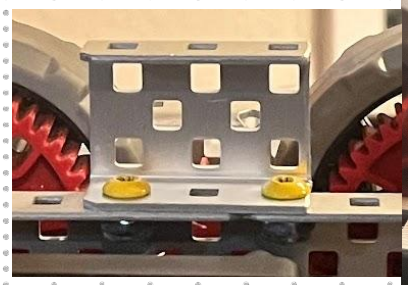
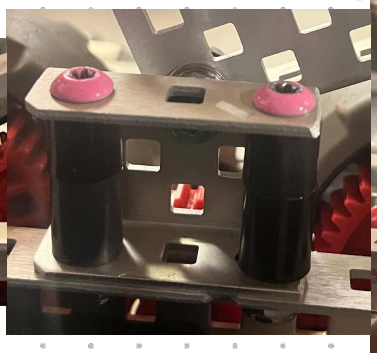
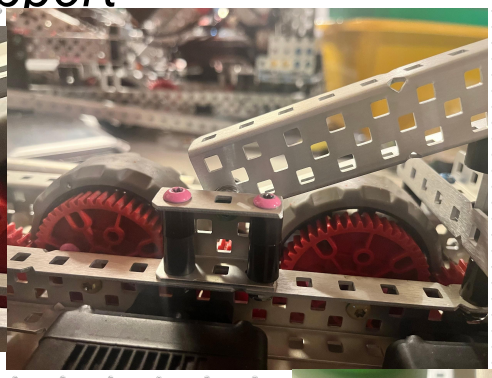
2 hour

*night shift goal: have penguini 1 driving with a functioning intake

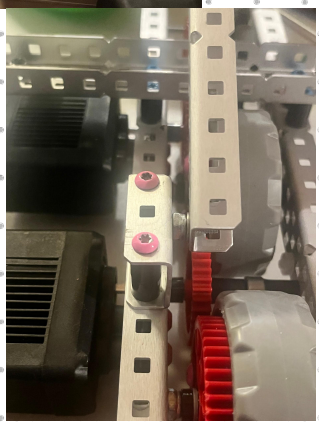
Project

Name Date Page

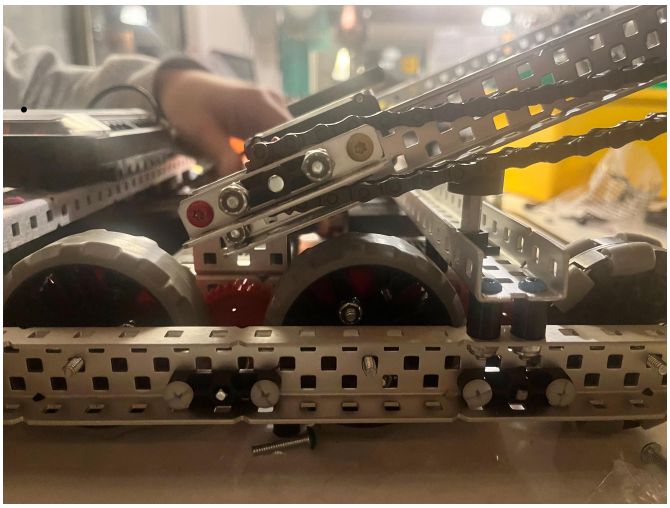
22:30 *progress: We began attaching the intake to the drivetrain. We used a 3 by 2 hole c channel as an anchor for the intake. Initially we placed yellow screws on the bottom but decided that it wasn't enough support. To solve this we used a pink screw over the top with spacers for extra support*

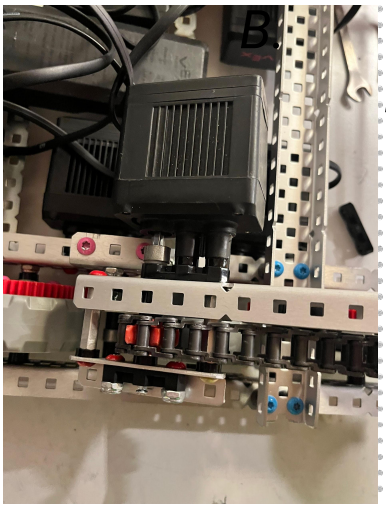




We used a screw joint to keep the intake movable. We used spacers on the left and a metal washer on the right. We considered using a plastic washer to save weight but deemed it wouldn't be durable enough.



23:30 *progress: we added a barrier for the intake. Additionally we changed the screw used to attach the intake motor to the drivetrain from a yellow screw, to a dark green screw. We did this because we thought that the yellow screws would be too short*





to hold the motor in place. We thought

We thought that the screws keeping the motors in may also be too small.

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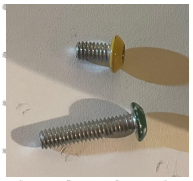
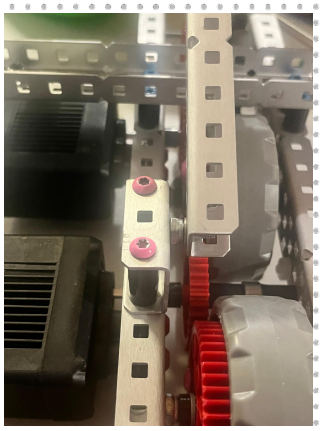
24:30 *progress: We measured the fully expanded height of Penguini and it was just under 18 inches. We weighed the bot in at about 1.5 pounds but found our scale may be inaccurate.*

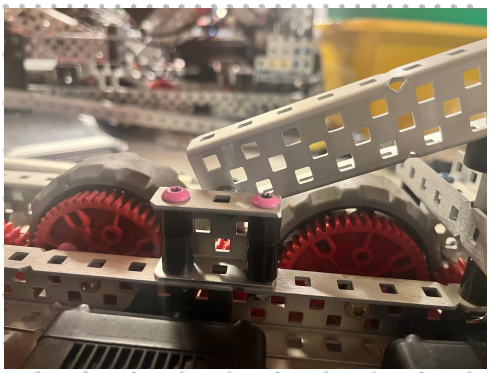
2am ran a test. Motors loose driver maybe prefers 600 rpm.

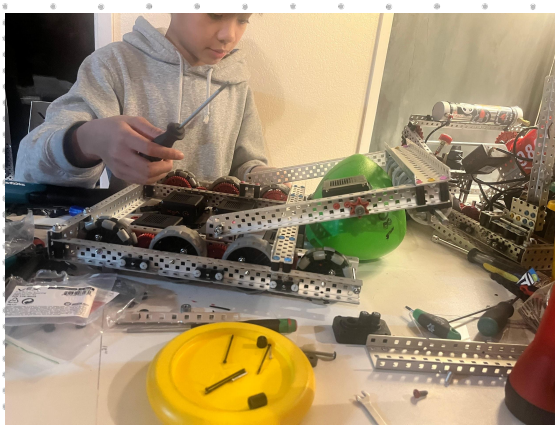


Switched the screws used to screw in motors cause they too short

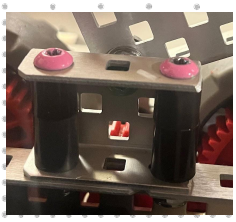


Metal washer. Sacrifice friction for sustainability





Almost 18 inches



Extra support spacers

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Chat/remdiners/talk to people

Brian:

henry:

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