North High S.T.A.R.S Portfolio

2024

Team #27518



Week one: October 21st, 2024

Meeting goal: Start building robot

Monthly Goal: Working robot by November 23rd

We began the first steps of putting the robot together today. This included assembling chain loops, screwing chain links together, and connecting individual parts to make a whole.

Lessons learned

-Given that this is most of the group's first time building a robot, it is important for everyone to learn how to cooperate. Making a robot is all about being able to collaborate with others.

- Collaboration: Daijanae and Destiny had to collaborate to finish steps 13-18, As they had different parts which connected together.
- Communication: Everyone in the team is starting to get to know each other and breaking the ice basically.

Assembly/ Engineering process

- Before this meeting, mainly organizing the room and tools, moving furniture and papers around.
- We're building the robot using the GoBilda instruction manual.
- Piecing equipment together:
    - Destiny: Steps 13-18 (Skipped 16)
    - Daijanae: Steps 1-6
    - Ethan: Steps 29-34

Outreach: Trying to recruit new potential team members.

Finance report: Raised 260$ on Raise365 as of today, thanks to everyone on the team reaching out to family, friends, and fellow coworkers.

Goal for next meeting:

- Reach out to potential fundraising. Also to finish steps 30-35

Season timeline:

- Our first competition will be at East Middle School in November!
- FTC- Into the Deep (Tasman League)

October 23rd

Meeting Goal: Step 30-40, Not yet reached.

Goal for next week: Completing or come close to completing the robot build. Long- term goal involves having a working robot by November 23rd.

Design and Engineering Process:

- Ethan: Skipped step 34, moved on to steps 40-44
- Almost halfway through the building process!

Skill Development:

- Learning to work with small materials like screws.

Coach guidance: Helped us with finding the tools faster, given that we're still getting used to the organization of the room.

Season Timeline:

- Brainstorming team shirt designs for competitions. We're including the MidAmerican Sponsor on its design.



October 28th, **Next Meeting Goal:** Work on OpMode Code and have Field done by next week!

Design and Engineering Process:

- Field tiles arrived
- Steps 40-44 included a 20-hole channel with 52 chain-links.
    - Team Member Destiny: Learned to work with chain links
    - Team Member Andrea: Although mainly involved in design, assisted with screwing in wheels to get an overall perspective on the building process.

Skill Development: Resilience- Our team member Brian's first time working with the robot. Some members underestimated the challenges building would come with, but we managed with problem-solving skills.

- Organization skills improved, and finding items for building doesn't take very long.
- We found breaking into smaller groups makes tasks more efficient and collaborative.

Finance Report: Raise360 Fundraiser concluded today, with $430 total!

Outreach and Service: Searching for possible companies that can fund/ sponsor us. Team member Ethan attended an Ames STUCO Conference, in which he observed FTC Practices. He made sure to ask teams about possible company sponsors, and is currently working on resources for robot design, such as OnShape.

October 29th meeting:

Design/ Engineering process:

- Destiny: Completed steps 42-50
- Brian: Completed steps 25-38

October 30th meeting:

Design and Engineering Process:

- Still setting up/ putting field together.
- We have 3 different designs/ concepts for a team shirt, trying to make a creative star-related one.
    - Step 22- combined assemblies from step 12 (Left and Right drive assembly)
    - Currently working on step 23: Attaching U-Channels and 117 RPM Gear Motor.

Outreach and Service:

- Members searched for possible companies that could sponsor:
  Team Member Crystal created a potential Google Doc script template to reach out to businesses, such as:

    - NextBeam
    - Sioux City Public Library
    - Jollytime Popcorn
    - Wilson Trailers
    - Tyson Events Center
    - Hy-Vee

    - Same goal; to finish setting up the field by the end of the week!

Season Timeline: Competition November 23rd, at least 4 team members expected to come: Ethan, Brian, Destiny, and Andrea

November: Robot Build Completed:

November 4th meeting:

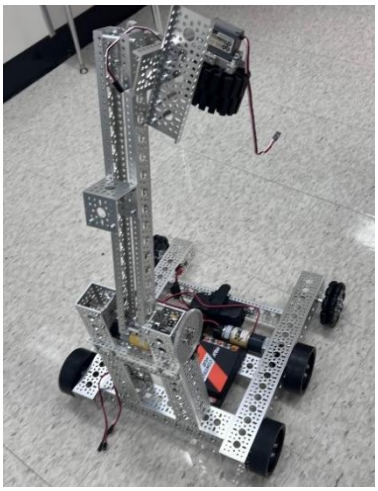
Skill Development:

New Discord Channels Finalized and Added: **Efficient Communication-** Announcements for competition, meetings, a general group chat, and channels such as: FTC resources, engineering

process, coding materials, fundraising, social media, and strategy; including a link to our shared Microsoft Whiteboard.

Engineering Process: Team made sure to software update all devices. Team member Brian is reattaching the Driver Hub to configure the motors.

Our robot for the FTC Competition at East Middle School:



November 6th Meeting:

Design/ Engineering Process:

Configured each motor by giving each a name. Control hub and Driver Hub are all updated.

Team members Ethan and Destiny followed InSite OpMode tutorials of how to code robot arm and controlling the motors.

Skill Development: **Debugging**

So far, much code debugging is needed, and coders are problem-solving, so the arm goes forward and backwards, without getting stuck halfway.

Strategy: Creating a Google Document of Do's and Don'ts, Manual Revision (Game rules)

Goal for next week: Finished code for manual robot movement, including wheels. Wire management and possibly start designing on OnShape CAD.

November 7th Meeting:

Engineering Process:

-Working on code to keep wheels from spinning all over the place. Controlling robot movement.

Outreach: Reach out to businesses through email (At least 5)

November 11th meeting:

- **Outreach:** Preparing robotics-related questions for the next meeting's visiting team member from East High School (coder).

- Brought Team Member Brian's siblings, who seemed interested in the robotics process:



Design/ Engineering Process:

- We struggled a lot with finding small missing screws.
- Team member Destiny helped with coding and setting up field walls.
- We came across issues with the screws and cogs being loose.

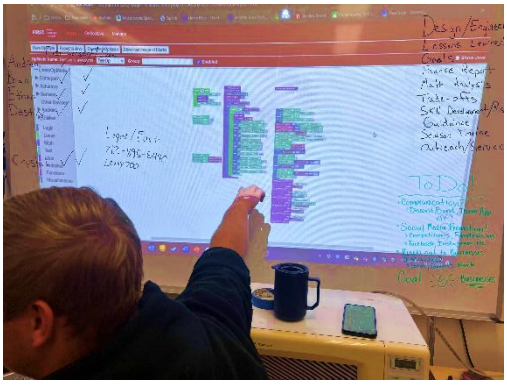
November 12th meeting

Outreach:

East high school robotics team member visit:

- Assisted with coding the wheels, and simplifying our code
- Instructions on the differences between TeleOp and autonomous mode
- East high school team member- Logan Ruby offered advice on how to improve our robot's code.

Engineering Process:



He suggested one gamepad runs the motors, while the other runs the servos. Logan advised us on game strategies, as to what direction to move the robot's arm, and how to maintain robot balance.

He also offered to assist us next meeting with adding continuous rotation to the servo.

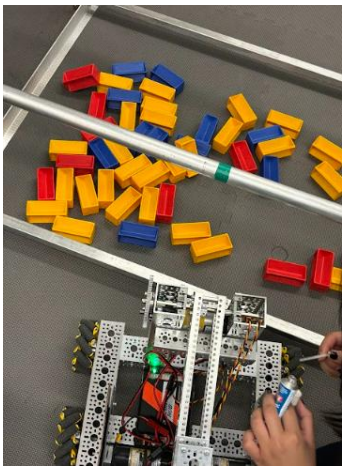
Skills Development: Patience and Strategy

His main advice for us at the moment was to focus on TeleOp strategy more than autonomous, and to not overthink coding solutions too much.

Next meeting goal: figure out what buttons we find most fitting for robot "teeth" and swivel.

November 13th meeting:

Outreach:



Logan came to help us with code advice and guidance again! We made sure to:

- Double check inputs on gamepad and configurations
- Build and keep OpMode first and then add to the main code

He helped us add variables for super-speed and slo-mo, which is more efficient as the only thing that would have to be changed are the motor directions.

November 18th meeting:

Season timeline and Outreach: Competition Schedule (FTC). We made sure to thank **MidAmerican** for their generous contribution to our team with a thank you letter!

-8:00- 8:45 am: Teams Arrive

-9:00- 10:15 am: Inspections

-10:30- 10:45 am: Driver's Meetings (2 drivers)

-10:45- 11:45 am: Matches Begin

-11:45- 12:30 pm: Lunch Break

-12:30- 4:00 pm: Matches Finish Up

-Wrap/ Clean-up



Design/ Engineering:

- Field is complete and we have been holding practice rounds with the robot.

Skill development:

- Ethan and Destiny (selected drivers) are refining their driving skills, doing as many practice rounds as possible before competition.

November 19th meeting:

Design/ Engineering process:

- Team member Destiny: Printed out label for robot team number onto sticker paper and the cardboard.
- We decided to have blue and red interchangeable plates that work with Velcro and are easier to reattach.

November 20th meeting:

Season timeline: Day before Competition!

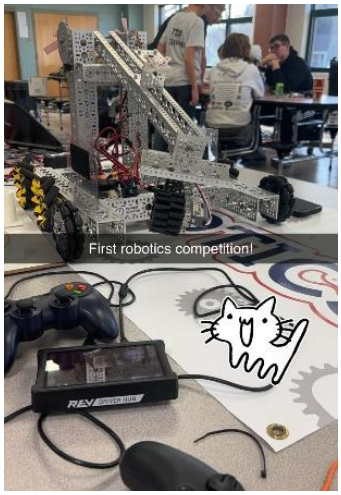
Engineering Process- Finalized button choices:

- Gamepad 1
  - left stick- moves the wheels forward or backward
  - right stick- moves the wheels sideways
- Gamepad 2
  - right stick- rotates the main arm forward and backwards
  - Dpad left+right- rotates the arm rotator sideways. If not held, it resets to original position
  - L1- teeth outtake
  - R1- teeth intake

November 23rd- Competition Day!



- Our competition is at East Middle School- Tasman League FTC.
- This competition gave us ideas for the team, and better cooperation skills with other groups.
- **Design/ engineering process:**
  - Inspection Notes
  - No switchboard (only a certain size)
  - Can take the front wheels off
  - Can add a grounding cable, and should have a more accessible power switch
  - We have creative ideas to make a poster board for our team, which can showcase us at competitions.



- Outreach: Team member Ethan assisted West high team with code problems.
- Team Molten Sprockets #8807 came up to us with in-game strategies for baskets, since their team robot may be able to reach the high bar during the ascension time period.



Our team won one match out of six!

November 26th meeting

Season timeline: After our first competition at East Middle.

Outreach/ service

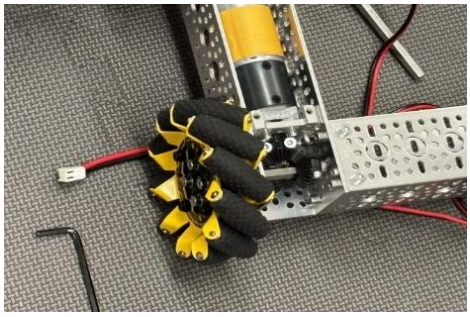
- We have come up with potential ideas for fundraising.
  -Bake sales
  -contacting companies; Jollytime: Contacted at the end of the meeting.
  -they have not yet responded.

We are coming up with designated positions for team members:

- Nicky- Spokesperson
- Ethan and Justin- Drivers

December 2nd meeting

Goals for the next competition:



- 4 motors
- Score specimen
- Rotate more
- Have functional autonomous code
- Hang specimen, ascend or park.

Season Timeline

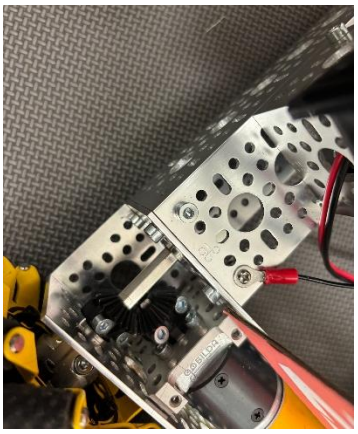
- 1 month before competition
- Design/ engineering process (+picture)
  - Adding the other channel to the base
  - Adding angled back wheels, the motor is a right angle
  -

Problem solving

- Based on the direction of the U-channel, it might make samples get caught.
- We're flipping robot to make sure samples don't get stuck.
- One side lets us connect more things, but risks getting sample lodged.
- Other side prevents blocks getting lodged, but less U channels to work with.

December 10th – **Design and Engineering Process**

- Assembling viper slides so we can extend the arm to reach high basket.
- Attatched expansion hub to our robot so we could add 3 motors on the arm and the two front wheels.
-
- Added a grounding wire/ cable.
- We moved the power switch so its more accessible, added a faceplate



December 16th, 2024

Design and Engineering Process:

- Now we are trying to attach viper slides to our previous robot.
- Ethan- working on simplifying movement code to a function. Making code more efficient.

Season Timeline: Competition December 21st at Hinton Elementary School

December 19th

Engineering/ Design Process

- Moved the tower inwards to meet the full extension length rule of 20x42
- Removed slides to have only one remaining on the viper slide, also to meet 20x42 rule
- Brian: worked on channel of the teeth to grab a sample more effectively.

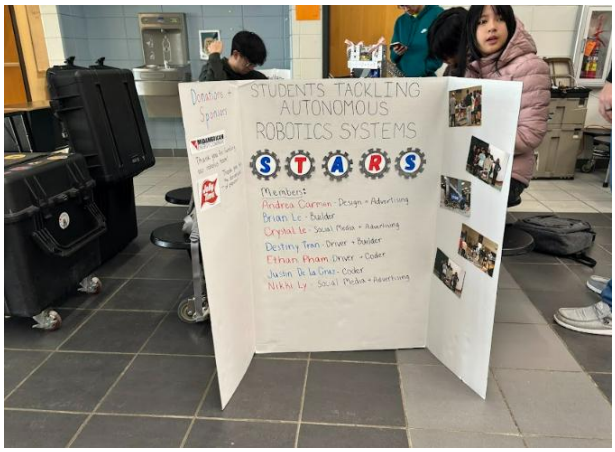
December 20th



Engineering/ Design process and Skill Development: **Problem Solving**

- First problem fixed was the chastity not fitting 18x18, because of the wheels
- The servo was not working, so we tested servos and problem solved by putting a different control hub in to see if it had power or not.
- Regrommed servo to spin/ rotate continuously.
- Added weight, 10lbs for counterweight
- Brian worked on adjusting the teeth, so it can pull in sample correctly. Adjusted it up and down.
- We switched back to 18x18 (starting configuration) because our arm was extended past 18x18.

December 21st : **Competition at Hinton Elementary School!**



Engineering/ Design process:

- **STARS** Poster Board displayed; made by team member Nikki

Inspection notes:

- If robot moves during intialization, it must be labeled as so.
- Team plate numbers must be 2 inches or taller.
- Robot channel corners must be smoothed (can use tape)
- Power switch must be placed on a side, not the back since it can be bumped into.

Outreach: We conversated with South Sioux team coach, Invited to FLL, an outreach event March 8th.

Problem Solving:

- Due to lack of time (school closing hours), we ran into many complications with the robot, and had to resort to fixing stuff inbetween queues. Including:
    - Autonomous code
    - Viper slide extension
    - General lack of practicing with robot driving

December 26th meeting: **Engineering and Design Process**

- Labeled wiring
- Attatched extension to it upside down so arm doesn't hit.

December 30th meeting: **Engineering and Design Process**

- Attatched small wheels to head at a certain angle so it doesn't drag on the floor and also helps pick up samples better.
- Attatched viperslide to score
- Team bonding with wingstop

Goal: extending wire for the servos.

January 2nd meeting: **Engineering and Design Process**

- Brian added longer rods to robot (surgical tubing)
- Added the shaft between the wheels to create space, between space he added zipties with surgical tubes

January 7th meeting: **Outreach**

- **Team members:** Destiny and Andrea went back and forth from the Jollytime Store and Supplier to get Jollytime donation of coupons which we used at Fairway for a future sale.

Season Timeline: Rankings from last FTC Competition- **#22**

January 14th meeting: **Outreach**

- Team members went to North Middle School to visit coding club
- Described how we coded, designed, and built our robot
- Demonstrated how robot functions
- Let the kids ask questions

Season Timeline: FTC Tournament at MOC Orange City Middle School, January 18th

Match Goal: We concluded our three-match season with a ranking of 22/26 teams. We are going to the tournament to gain competition experience, since we're the first North High competing robotics team in a while.