

SUMMARY:

We are the Highland Park Owls from Highland Park High School. Our club consists of approximately 10 students. We have weekly meetings in our school and as the season progresses, extended meetings in a team member's house as well. Some of our season highlights include:

- Having an efficient system to keep the preparation stages of the season organized. For example:
 - The E-Board (officers of the club) meets before every after-school meeting to discuss the progress made and the goals of an upcoming meeting.
 - Creating flowcharts and meeting logs
 - Incorporating freshmen/newcomers into the team and enhancing productivity by assigning roles and making sure everyone is contributing in some way to the team.
- Holding workshops over the summer to encourage more freshmen to join the club. It also largely expanded our programming team, which the lack thereof was a large weakness in our club in past years.
- Expanding the team's budget through:
 - Applying for and receiving a \$2000 grant by Walmart
 - Applying for and receiving a \$300 grant from our school's Student Congress
 - Launching a 3D printing fundraiser, selling 3D printed figurines to students and school faculty.
 - As a result of the increase in budget, we were finally able to afford REV. Over the course of a month, we have made REV parts the standard of our club. While we may use some Tetrix parts in the future, the robots we will have will be made of mostly REV parts.
- Increased diversity and participation within the club through many years of varying outreach activities targeted towards elementary and middle school students.
- Fun team bonding activities involving excessive amounts of bubble tea and chips, and a lot of ping-pong.

Team Number: 12417

Key Pages:

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Team Section

Team Members

Leadership

- ❑ **Coach/Supervisor:** Mr.Lee

- ❑ **President/Head Programmer:** Jessica (Senior)
Member of Programming and Outreach Team. She is interested in math and physics. She joined our FIRST Tech Challenge Team because she sees it as a valuable experience to learn more about engineering and technology.
- ❑ **Vice President:** Kimmy (Senior)
Member of Design and Programming Team. She is interested in science and reading. She joined our FIRST Tech Challenge Team because she was convinced by a friend to participate.
- ❑ **Secretary/Head Engineer:** Jouan (Sophomore)
Member of the Engineering Team. He enjoys playing chess, swimming, sleeping, and feeling free. He joined our FIRST Tech Challenge Team because he is interested in the STEM field.
- ❑ **Treasurer:** Isaac (Sophomore)
Member of Programming Team. He is interested in math and video games. He joined our FIRST Tech Challenge Team because he thought it would be an interesting experience.

Members

- ❑ Cynthia (Junior)
Member of the Design and Build team, she is interested in how robots are made and how they function. She joined our FIRST Tech Challenge team because she is interested in how robots would compete and how the designs of the robots would differ.

- ❑ Tucker (Junior)
Member of the Build Team, he is interested in how to make a robot. He enjoys mobile games and physics. He joined our FIRST Tech Challenge Team because he wants to know how to build a robot and how to compete with it.

- ❑ Chris (Junior)
Member of the Design and Build Team, he enjoys building and working around design and engineering challenges. He joined because he wants to become a particle physicist and this field

may require coding. Therefore, he wishes to reinforce his current knowledge of code by hoping he may get to code in the future for our FIRST Tech Challenge team.

❑ Tara (Junior)

Member of the Design and Programming Team. She enjoys designing and figuring out coding challenges. She joined our FIRST Tech Challenge Team late this year but is fully involved and working hard, she hopes to expand her knowledge of coding and working with our team.

❑ Marie (Sophomore)

Member of Design and Build Team. She enjoys designing and drawing. She joined our FIRST Tech Challenge Team because she wanted to use her skills and apply them to her interest in robotics.

❑ Kayra (Sophomore)

Member of the Design and Build Team. She is interested in Building and designing Robots. She enjoys drawing/sketching. She joined our FIRST Tech Challenge Team because she was looking for a way to test her skills and compete.

❑ Jacob (Sophomore)

Member of the Design Team, he is interested in graphic design and information systems. He joined our FIRST Tech Challenge team because he wanted to test his own skills in a competition.

❑ Stella (Sophomore)

Member of the programming team, she enjoys reading and writing. She joined our FIRST Tech Challenge team because as a new student she was previously interested in STEM and then learned about this club and decided to join in order to further grow her interests and skills.

About the Team

❑ **Team formation**

- Flyers were put up around the school and announcements were made to advertise and attract new members and remind old ones
- There was a meeting before the school year for pre-existing members to prepare and organize for the year to come

❑ **Team bonding**

- We started the year out with pre-season prep where we held a team bonding experience in cleaning Isaac. During this experience our team bonded, we also organized this room to be our out of school meeting area.

❑ **Fundraising**

- **Bake-sales:** We run bake sales at least once a month that includes multiple delicious baked treats that we offer to the students passing by to help raise money for our team
- **T-Shirts:**
 - We have t-shirts designed by one of our own members that we sell to our very inclusive and active community to help raise awareness and gain support for our club while also raising money for our funds
- **Grants:**
 - Last year, in the pre-season, we applied for and received a \$2000 grant from Walmart.
 - \$800 donation from our school's Student Congress
- **3-D Printing:**
 - We have a 3-D printer that we offer the use of to the entire school, student or staff, they can order custom figurines and knick-knacks that we charge printing for (price based on size)
 - We advertised this fundraiser with flyers that we hung around the school

❑ **Outreach**

- **Back to school:**
 - We had a booth at our back to school night where we advertised our club to parents and students and showcased our previous year's robot from another competition to showcase the skills we applied and how much our club is able to do

- **The Cave:**
 - We planned workshops at a popular, local youth after school program, the Cave, to introduce, inspire, and develop an interest in kids who may have never thought of joining or working in the robotics field
 - We designed simple, but challenging engineering challenges for the kids to solve, and will mention how robotics principles can be applied in everyday life
- **Street Fair:**
 - A street fair is an event in our community where the people of the highland park sell and advertise their businesses. We got permission and set up a stand where we showed the people of our accomplishments and even interested in some major corporations in our community.
- **AP Computer Science Class:**
 - Towards the beginning of the year, Jessica and Kimmy created a presentation for students enrolled in AP Computer Science within our school to expand the programming team. We gained 1-2 coders from this.
- **The Middle School:**
 - We showed middle schoolers enrolled in technology classes a multitude of videos of our competition robot from previous years and introduced them to block coding.

Meeting Logs:

September 1, 2019

Location: Isaac and Jessica's house

Duration: 1:00pm - 5:00pm

Attendees: Jessica, Isaac, Kimmy, Jouan, Marie, Kayra, Christine, Andre, Patrick

- Cleaned out Isaac's basement for future use for testing and building
- Team Bonding (Youtube Videos, Music, Bubble tea and Pizza)
- Added an extra table to the basement (for later use to build the FTC robot)



(We started the FTC season with a party! Everyone had a BLAST)

September 10, 2019

Location: Mr. Lee's room

Duration: 11:20am - 11:40 am

Attendees: Jessica, Isaac, Kimmy, Jouan

- Prepared for intro presentation to new members of the robotics club (first meeting)
- Discussed parts we need to buy
- Assigned Jouan with organizing bake sales

September 10, 2019

Location: Robotics Room

Duration: 2:45pm - 4:15 pm

Attendees: Jouan, Isaac, Jessica, Kimmy, Christine P, Maria, Marie, Kayra, Jake, Andre, Christine C, Akhul, Noah, Jakob, Tucker

- Introduced new members to the club with a PowerPoint about the various competitions and events that will be participated in throughout the year
- Introduced FTC competition
- Divided into smaller groups, coders, and engineers and discussed the responsibilities and tasks of each team
- Quick Eboard meeting afterward to discuss goals

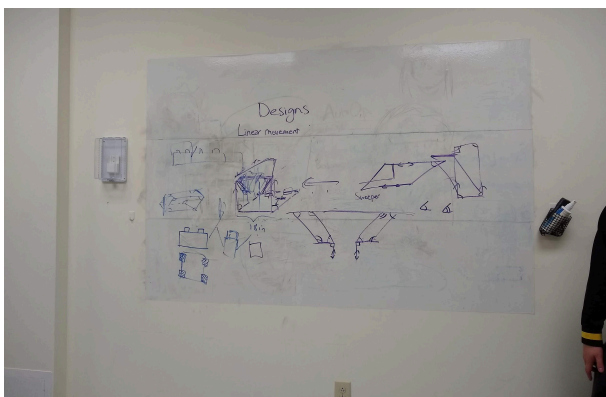
September 17, 2019

Location: Robotics Room

Duration: 2:45pm - 4:00 pm

Attendees: Jouan, Isaac, Jessica, Kimmy, Christine P, Maria, Jake, Andre, Christine C, Akhul, Noah, Jakob, Tucker, Chris, Nicole

- Gave an intro to the FTC Skystone challenge this year by showing the video that described the tasks and overall background information of the competition
- Discussed ideas and designs for robot and different methods and approaches to the requirements given



(Jouan gave a long-winded and detailed explanation of his plan for the robot, met with some criticism)

September 20, 2019

Location: Senior Quiet Room

Duration: 11:30am - 12:00pm (Lunch)

Attendees: Jouan, Isaac, Jessica, Marie, Maria, Kayra, Andre, Christine P

- Discussed details of Robot design plan

September 24, 2019

Location: Mr. Lee's Room

Duration: 11:15am - 11:30 am

Attendees: Jouan, Isaac, Jessica, Kimmy

- Prepared for after school meeting and decorated the bulletin board

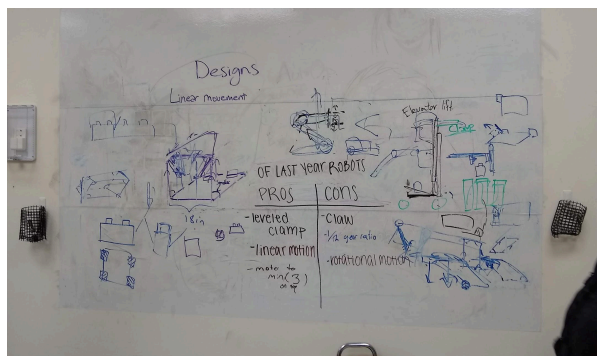
September 24, 2019

Location: Robotics Room

Duration: 2:45pm - 4:00 pm

Attendees: Christine Chen, Jakob Hargreaves, Jacob Marsh, Noah Shapiro, Christine Park, Marie Mao, Jouan Yu, Franz Minaya, Isaac Wu, Jessica Wu, Nicole Chakhalian, Maria Hu, Satayjit Gade, Tucker Wang, Stella Zhuang, Cynthia Zhuang, Abigail

- Discussed possible designs and Jouan realized a design flaw
- Planned on building next meeting
- Continued decorating the bulletin board next to robotics room to attract new members
- Introduced new members and caught them up on the FTC competition and introduced them to the rest of the club



(Lots of discussion about the robot occurred, with members contributing by writing their ideas on the whiteboard)

October 3, 2019

Location: Robotics Room

Duration: 11:20am - 11:35 am

Attendees: Marie, Isaac, Jess

- Worked further on the bulletin board located outside the Robotics Room in order to attract new members and inform the school of our club

September 24, 2019

Location: Robotics Room

Duration: 2:45pm - 4:00 pm

Attendees: Christine Park, Marie Mao, Jouan Yu, Isaac Wu, Jessica Wu, Kimmy Lin, Nicole Chakhalian, Maria Hu, Tucker Wang

- Went over code with coders(introduced GenericDriverOp, ArmSys, MoveSys, etc.)
- Introduced the tradition of rivalry between coders and builders
- Built 1st chassis of FTC robot, and started working on designing and building the FTC arm

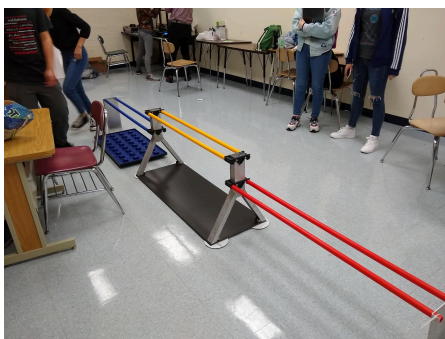
October 15, 2019

Location: Robotics Room

Duration: 2:45pm - 4:00 pm

Attendees: Jakob, Noah, Jouan, Isaac, Kimmy, Cynthia, Stella

- The packages for the FTC playing field and the new REV kit arrived
- Opened the FTC playing field packages and constructed the field in order to be ready for testing



(The field is set up for our robot to maneuver through)

October 22, 2019

Location: Mr. Lee's Room

Duration: 11:15am - 11:30 am

Attendees: Jessica, Isaac, Kimmy, Jouan

- Discussed the goals of the meeting
- Discusses plans for the arm
- Assigned each coder a different task in the code in order to be organized and include each member

October 22, 2019

Location: Robotics Room

Duration: 2:45pm-4:00 pm

Attendees: Jake, Kayra, Marie, Jouan, Isaac, Kimmy, Jessica, Maria, Tucker, Cynthia, Stella

- Finished the first node of the arm
- Split up the workload for the code
- Isaac took inventory of the REV kit parts

Code:	Name:			
AutoOps:			Key:	Urgent
RedNear	Isaac			Need to be in process
BlueNear	Stella			waiting for something
RedFoundNear	Stella			
BlueFoundNear	Stella			
RedFoundFar	Isaac			
BlueFoundFar	Isaac			
RedStoneFar	TBD			
BlueStoneFar	TBD			
RedStoneFoundFar	TBD			
BlueStoneFoundFar	TBD			
Systems:				
ArmSys	Kimmy			
MecaMoveSys	Jessica			
OpticSys	Kimmy			
TesterOps:				
DriverOps:				
GenericDriver	Jessica, Stella			

(coding jobs being distributed)

October 29, 2019

Location: Robotics Room

Duration: 2:45pm-4:00pm

Attendees: Jake, Jakob, Jouan, Isaac, Cynthia, Stella, Tucker

- Set up the software with coders
- Worked on gear ratio in the arm for the robot

- Cynthia improvised an idea on how to make the robot balance better, and her idea was implemented on the robot

November 12, 2019

Location: Robotics Room

Duration: 2:45pm - 4:45pm

Attendees: Jake, Jacob, Noah, Isaac, Jessica, Kimmy, Jouan, Stella, Cynthia, [new junior], Chris, Tucker, Marie, Maria

- Coders worked on the movement system
- Builders split up into three groups, each working on chasse, arm, and clamp. Members played around with the parts for more experience.
- Eboard meeting afterward about leadership and not repeating past mistakes while including everyone

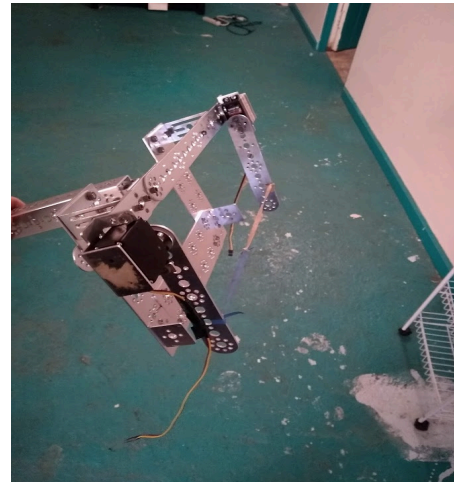
November 13, 2019

Location: Isaac's basement

Duration: 3:30pm - 5:00 pm

Attendees: Jouan and Isaac

- Finished building the clamp for the robot
- Modified the chasse to be able to fit the clamp
- Set up a table for Engineering Purposes



*the clamp, or collection mechanism that will be used to collect yellow blocks and deliver skystones

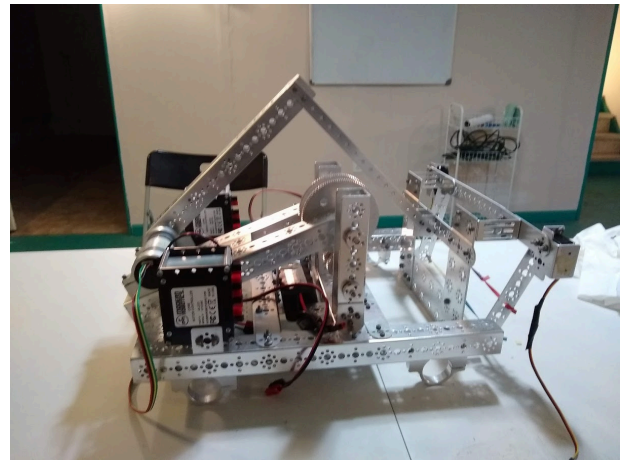
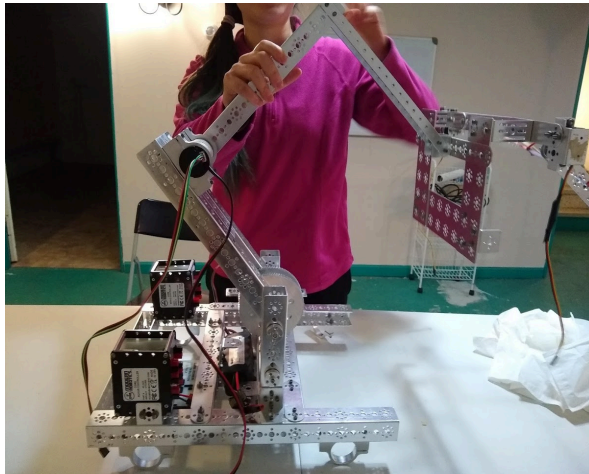
November 17, 2019

Location: Isaac's Basement

Duration: 5:00pm - 7:30 pm

Attendees: Jouan, Isaac, Jessica, Kimmy, Marie, Jake

- Finished the metal structure of the robot
- Attached the clamp to the arm and attached the piece altogether to the chasse
- The robot is almost done and will be testable once the cables are connected
- First dinner as a club (we ate pizza of course)



*first prototype of the robot is about to be finished

November 19, 2019

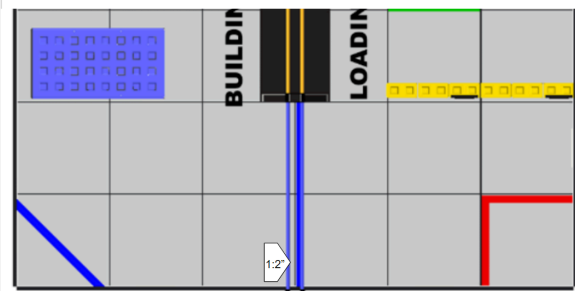
Location: Isaac's Basement

Duration: 2:45pm - 6:00pm

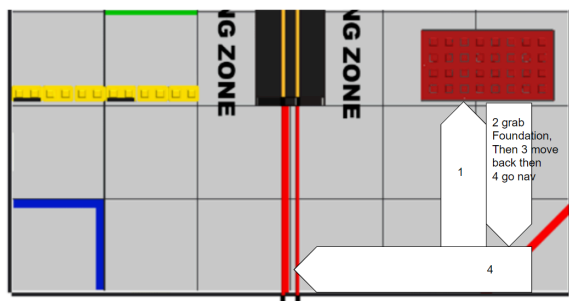
Attendees: Kimmy, Jessica, Isaac, Jouan, Marie

- Worked on coding for the robot to work
 - Created flow charts of all the AutoOps
- Continued building the robot
 - Found a place for the robot phone

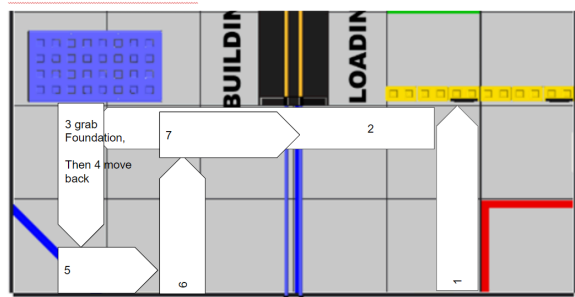
BlueNear



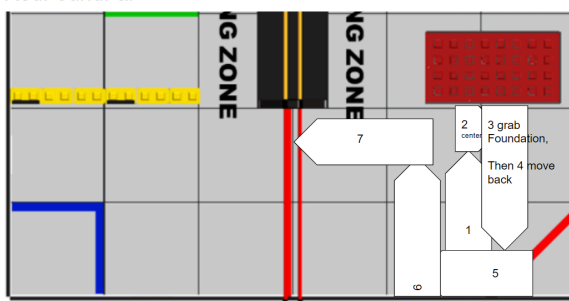
RedFoundNear



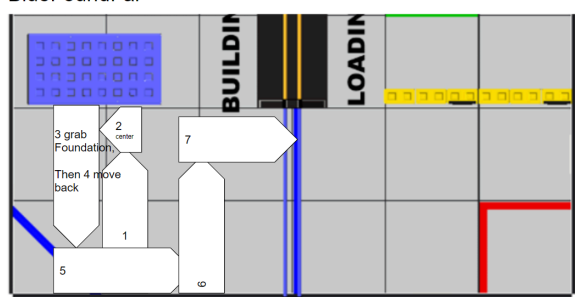
BlueStoneFoundFar



RedFoundFar



BlueFoundFar



- Finished AutoOps
- Started planning and coding OpticSys
 - Setting up openCV
 - Object detection

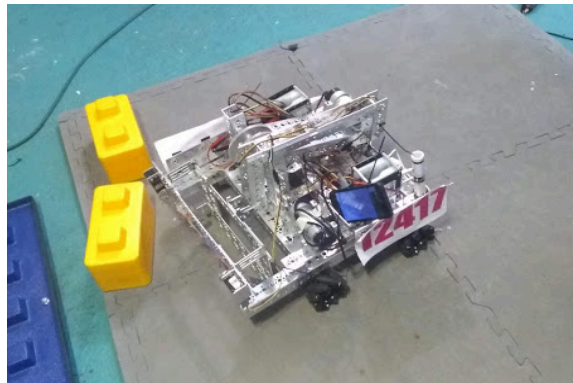
November 30, 2019

Location: Isaac's Basement

Duration: 2:00pm - 4:00am

Attendees: Kimmy, Jess, Franz, Tucker, Chris, Jouan, Marie

- Continued tweaking and working on the robot and code
- Tested the robot and the arm
- Allocated certain team members to work on the engineering journal
(we tested the robot)



December 1, 2019

1st Meet (WOOOHOOOO!!!)

Location: Girl Scouts of the Jersey Shore Activity Center

Duration: 8:30am - 3:00pm

Attendees: Kimmy, Jess, Jouan, Isaac, Tucker, Stella, Cynthia, Chris, Marie

- First Competition
- Won 3 out of 5 rounds and made it to semifinals(Big improvement from last year's competition)
- Checked out other teams' designs for ideas on a better design
- Pep talk at the end of the competition about the next competition which is in 2 weeks

December 8, 2019

Location: Robotics Room

Duration: 2:50pm - 8:30pm

Attendees: Jess, Kimmy, Jouan, Isaac, Marie, Cynthia, Tara

- Thought of designs for the new REV bot for the next competition, considered the best design, and built the chassis.
- Introduction of new structure for code
- Introduced new member to the club who looks towards working on code for the robot

December 10, 2019

Location: Isaac's basement

Duration: 4:00 pm- 10:00 pm

Attendees: Jess, Kimmy, Jouan, Isaac, Marie, Cynthia

- Continued to build upon the robot. We finished the general build of the robot.
- Created a copy of the old code for TETRIX robot and edited it to account for new design ideas for the REV robot
- Created the blue and red markers out of cardboard.
- Created a capstone out of cardboard.

(the capstone)



December 14, 2019

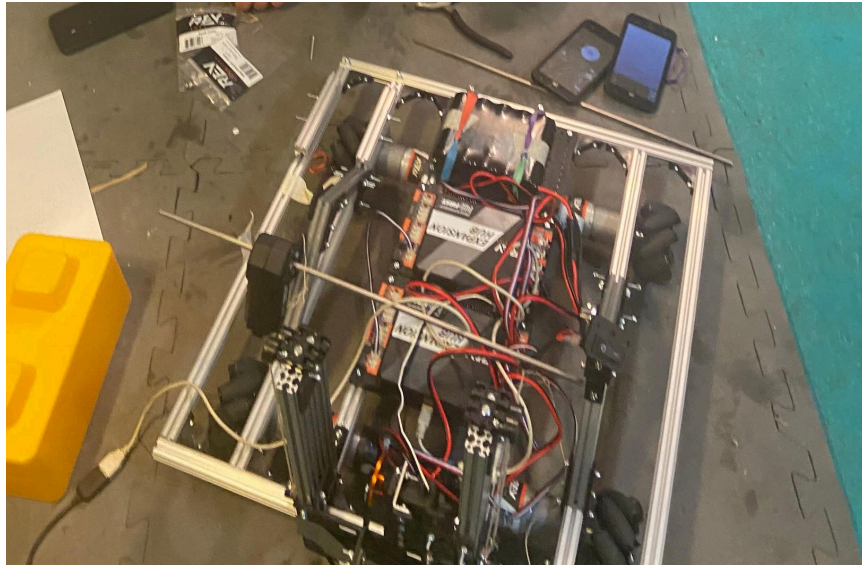
Location: Isaac's basement

Duration: 7:00pm-3:00am

Attendees: Kimmy, Jess, Jouan, Isaac, Jake, Marie, Cynthia, Stella

- Finishing the robot for the competition
 - Stringing and testing the linear actuator
 - Organizing the wires
 - Figuring out where to put the phone
 - We decided to use a rubber band to tie it down
- Worked on potentially integrating the color sensor for optic system(not sure if we are doing this)
- We tried to 3D print samples of the red and blue markers to see if they would be better than the cardboard markers. The red one did not print successfully and we ran out of time to print another one, so we decided to use the cardboard markers for the upcoming meet.

- Past alumni Max and Duncan visited to examine what we were doing and make suggestions regarding our current design
- Testing the robot for the competition
 - Testing code
 - Mostly autonomous and the arm system
 - Set aside time for the driver to practice driving the robot
- Drank bubble tea as sustenance for the night



(final design of robot we are using to compete tomorrow)

December 21, 2019

Location: Isaac's basement

Duration: 2pm-5pm

Attendees: Jess, Isaac, Jouan, Jake, Stella

- Discussed new "hollow build" robot design
 - possibility of a mechanism which will flip the block over the top of the robot
 - The hollow build will allow for the robot to have two wheels acting like mandibles to guide the block inside the robot, where the block will be taken out of the robot by a clamp inside the robot that can build towers more easily
- took apart old tetrax robot

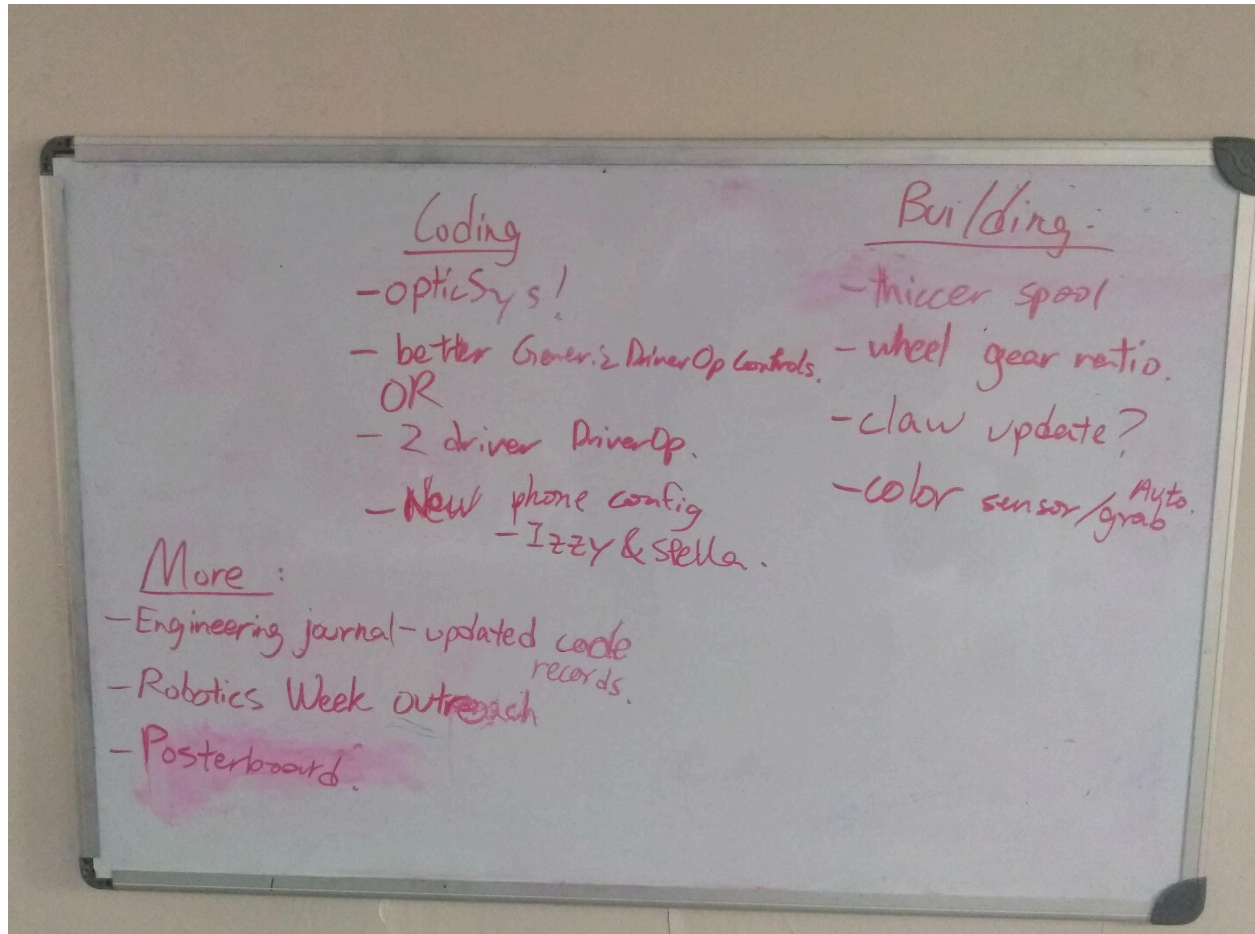
December 23, 2019

Location: Isaac's basement

Duration: 1pm-6pm

Attendees: Jess, Isaac, Jouan, Jake, Kimmy

- Ruled out the possibility of a "hollow build"
- Continued working on OpticSys
- Started making robot more efficient
 - Gear Ratio for motors to increase linear speed
- Designed and started working on a tri-fold



(Plans for the future)

December 28, 2019

Location: Isaac's Basement

Duration: 2pm-4pm

Attendees: Isaac, Jake, Jouan

- Finished gear ratios for wheels
 - Ruled out using chains
- Placed an Expansion hub on the robot
- Coded first prototype of a Stone AutoOp

December 30, 2019

Location: Isaac's Basement

Duration: 2pm - 7pm

Attendees: Isaac, Jouan, Jake, Jess

- Added spool for linear actuator strings
- Added battery and phone holder to the robot using rubber bands
- Added a new clamp and color sensor to detect skystone during AutoOp
- Stone AutoOp was improved upon

January 3, 2020

Location: Isaac's basement

Duration: 3pm - 8:30 pm

Attendees: Christine, Marie, Jouan, Isaac, Kimmy, Jess, Tara

- The poster used for displaying what our team does and presentation was made
- Measuring tape used for parking as an extension to make parking easier
- A new gamepad was added to the code, so there is a two-player class where the robot is controlled by 2 people
- Wires were zip-tied for better organization and easier testing
- Added a servo to deposit skystone
- The robot chassis were sealed together and the robot is finished

January 10, 2020

Location: Isaac's basement

Duration: 3pm - 5:30 pm

Attendees: Isaac, Jess, Kimmy, Tara, Jouan

- fixed stone autoOp
- Finished twodriverOp
- Started driver testing(not driverOp, driver)

January 12, 2020

Location: Isaac's basement

Duration: 1pm - 4:30pm

Attendees: Isaac, Marie, Christine, Jess, Kimmy

- tried to fix constants
 - wheels have some errors, preventing accurate constant testing

January 14, 2020

Location: Isaac's basement

Duration: 3pm - 5pm

Attendees: Isaac, Jess, Kimmy, Jouan, Jake, Marie, Kayra, Stella, Cynthia, Christine

- put new strings on robot
- fixed small problem with battery container
- driver testing
- tightened front left motor so that strafing doesn't make robot shift

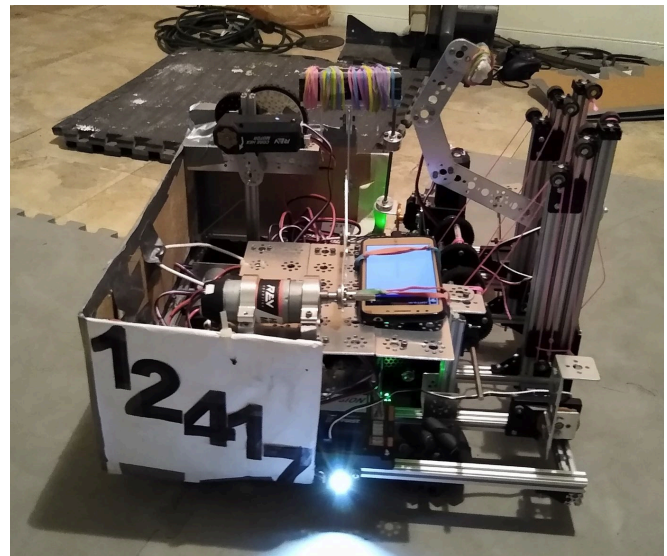
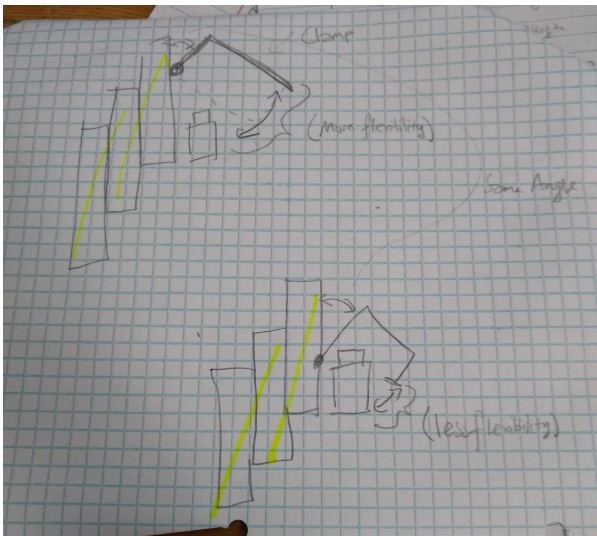
January 21, 2020

Location: Isaac's basement

Duration: 3pm-5:30pm

Attendance: Isaac, Jess, Kimmy, Jouan, Jake, Marie, Tara, Stella, Cynthia, Chris

- tried to design new arm
- Placed the linear actuator servo higher up to allow greater flexibility when picking up blocks
- started a new system for ArmSys



January 23, 2020

Location: Isaac's basement

Duration: 5:30pm-7:00pm

Attendance: Isaac, Jouan, Jess, Kimmy

- changed front clamp to make sure two clamps don't interfere in root(initial) position
- Added two servos with an L shaped hook to grab onto foundation during the autonomous
- fixed new system for ArmSys
- Tested Robot Skystone AutoOp

January 26, 2020

Location: Isaac's basement

Duration: 1:30pm-4:30pm

Attendance: Isaac, Jess

- Coded foundation clamps
- Configured front clamp
- adjusted AutoOps so they match new ArmSys - confirmed that the new hardware added to the robot does work

January 28, 2020

Location: Isaac's basement

Duration: 3:00 pm - 6pm

Attendance: Isaac, Jess, Kimmy, Tara, Cynthia, Stella, Jake, Marie

- fixing constants in auto-ops
- Practice our judging interview

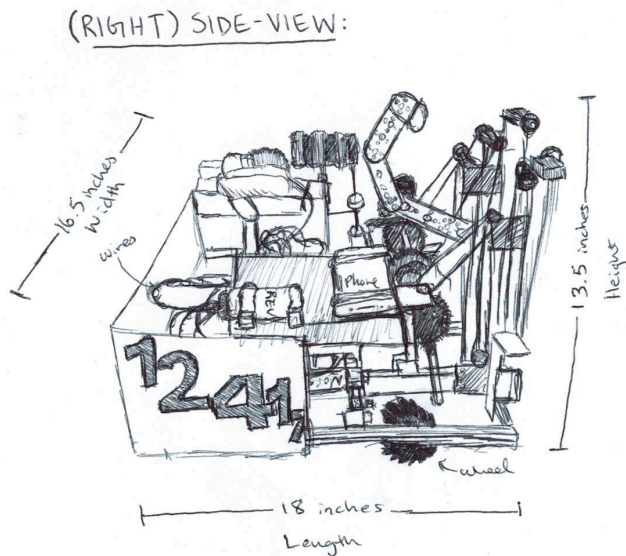
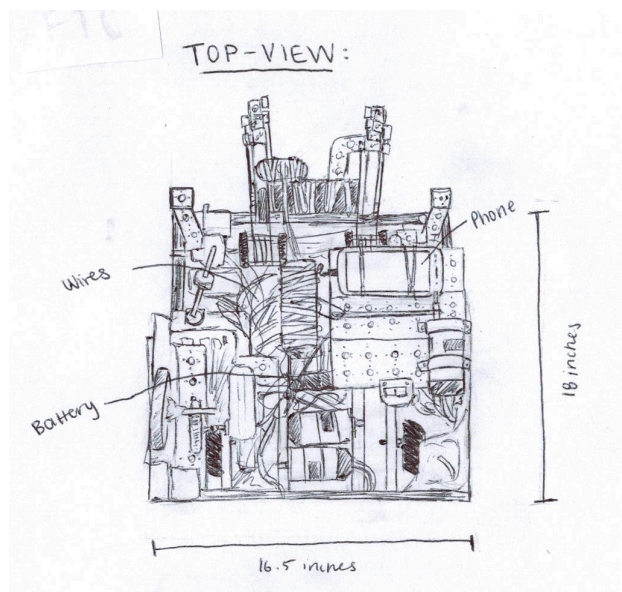
January 30, 2020

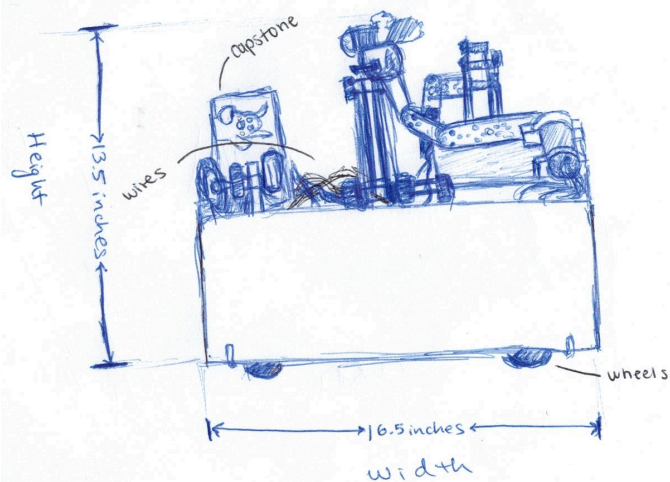
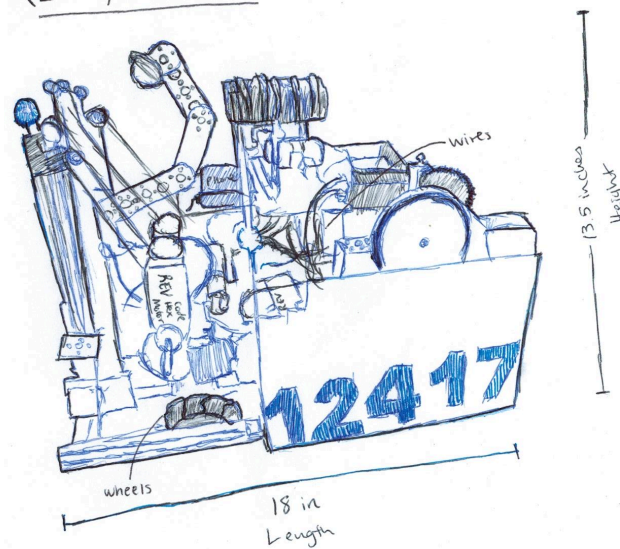
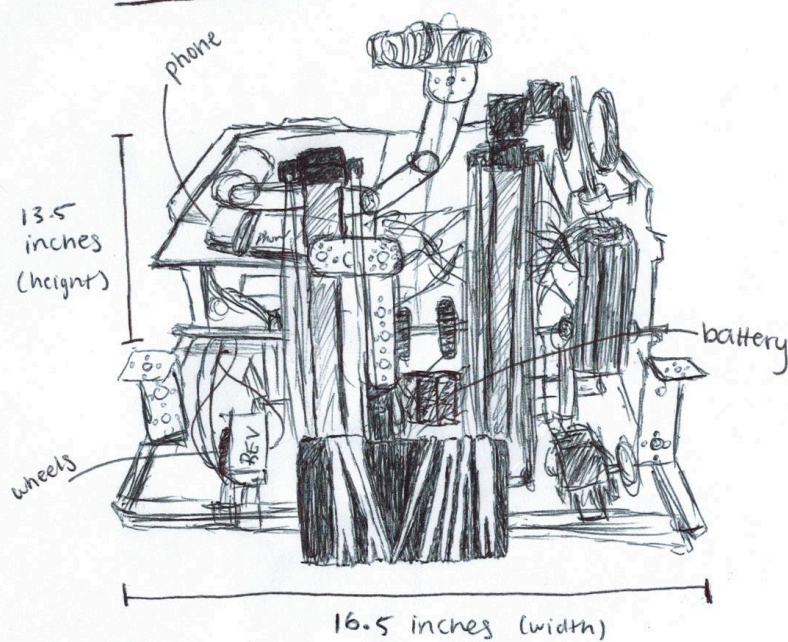
Location: Isaac's basement

Duration: 3:30 - 5:30

Attendance: Isaac, Jess, Jouan, Marie, Andre, Tara, Jake, Stella

- Practiced judging interview
- Made sure autoOps were working by performing multiple tests
- finalized the design of the robot



BACK VIEW:(LEFT) SIDE-VIEW:FRONT VIEW:

Finalized Design of the Robot

TEAM PLAN

BUSINESS PLAN

Team Financial Statement:

Item	Cost(\$)	Explanation
FTC registration	275.00	FTC Registration
Partial Game Set	300.00	FTC Game Field
REV FTC Starter Kit	444.00	FTC Kit
Electronics Modules and Sensors Kit	129.00	FTC part
Linear Motion Kit(x8)	96.00	FTC part
Small Pulley Bearings(x2)	20.00	FTC part
UHMWPE Cord	5.00	FTC part(used in Linear Slides)
Surgical Tubing	5.00	FTC part(used in Linear Slides)
REV Mecanum Wheels	90.00	FTC part
REV Motors(x4)	112.00	FTC part
Extrusions	40.00	FTC part
Touch Sensor	15.95	FTC part
TETRIX Motor	28.00	FTC part
Dremel Rotary Kit	69.00	FTC tool
REV Expansion Hub	148.75	FTC part
Control and Communications Set	219.00	FTC part
T-shirts	454.40	Robotics Merchandise

String	8.49	FTC Part
Mats	19.99	FTC Part
Subtotal:	2035.18	
Source of Money	Amount of Money	
Student Account	607.27	Money we have which we can access directly
Motorola Grant Rollover	70.25	Money we have left from the Motorola Grant from 3 years ago
Walmart Grant	2000.00	New grant we obtained this year
Courtyard Makerspace Grant	900.00	Grant specifically to create a Makerspace in our school
Fundraising	197.00	Money from school fundraisers
Subtotal:	3774.52	
Bottom Line:		
Total:	1739.34	

STRATEGIC PLAN

Short-Term Goal:

- Due to the recent grants that we have received, we finally have enough money to buy REV parts. Unfortunately, we have not had enough time to familiarize ourselves with these parts so our robot is still mainly composed of TETRIX parts. By next season, we hope to be able to build the robot entirely of REV parts.
- Although our club seemingly has many members considering our school's small size, few are consistent in attendance. We are working towards providing incentives to motivate team members to be more consistent in attendance through for example:
 - Only offering leadership positions to members with near-perfect attendance and active contributors.
 - Discounts on club merchandise
- Passing down coding, engineering, and 3D design knowledge to younger members of the club.
- Earn some extra cash through more fundraising ideas in addition to bake sales and our 3D printing fundraiser.

Long-Term Goal:

- Seek more outreach activities to spark interest within younger students of our school district.
 - Planning on creating a financial/outreach team to deal with our team finances. This group would not only attract business-bound students within our school to the club, but would also allow for continued focus on grants, seeking sponsors, and other methods of obtaining money throughout the competition season.
 - Our club has always struggled with our budget. As a result, we have lacked the money to buy essential materials such as the parts we need for our robot. In recent years, we have slightly expanded our budget through grants and fundraisers. Through the outreach team, we could potentially further expand our club's finances.

See Sustainability Plan for further elaboration.

SUSTAINABILITY PLAN

- Before the season began, senior members of the club held workshops that revolved specifically around the programming and CAD aspects of FTC. During specific weekends, future and current members who were interested in programming would meet in our town's public library and learn about the basics of Java and CAD.
- During the season, we further incorporated newer members, assigning them to either the programming or designing/building team. We spent the first few meetings ensuring that they were comfortable and familiar with the environment and materials we are working with. Currently, older members are leading newer members through the processes of programming and robot building, incorporating everyone's ideas rather than completely dominating each group.
- After the season ends, we will continue to encourage the members of our club to participate in other events such as hackathons and other robotic competitions. For example, SeaPerch is an underwater competition our robotics team competes in annually to continue building experience, especially amongst newer members. Workshops on CAD and other necessary areas will also continue upon request from the team. These workshops will be led by upperclassmen in both the building and programming team.
- Towards the end of the year, the roles taken by the seniors will have to be replaced by underclassmen. Specifically, next year's leadership positions will be appointed and former officers of the club will inform the appointed officers about their job and what would be expected of them.
- In order to extend coding knowledge to younger grade levels, four members of the robotics club went to the middle school on a Thursday during the week of code to introduce middle schoolers to programming through block code. We hoped to foster interest within lower grade levels so they would join the middle school robotics club and hopefully the high school robotics club as well. In the future, we will continue planning such outreach activities to attract potential younger members to the club.
- Continue applying for a multitude of grants after the FTC season ends to expand the budget of the club.

SWOT Analysis

Strength	Weakness
- No restrictions from adults - Lots of experience	- No Mentors - Lack of Funding from school - Recruiting members - Access to resources
Opportunities	Threats
- Generating community awareness and interest in STEM - Grants & Sponsors	- Change in school internet & device use policy - Lack of senior members - DECA & Model UN