Team Logo

RUBYTECH

FTC TEAM

Federal Government College Rubochi Robotics/AI laboratory,

P.M.B 1008,

Kuje, FCT,

Abuja, Nigeria.

TABLE OF CONTENTS

SECTION 1: TEAM SECTION

ABOUT OUR TEAM

• *How our team was formed and Achievement so far:*

Our team is made up from group of students who are in a DIY and coding club in the school college where they have being creating amazing DIY projects, learning coding and representing the school at various level in IT competition winning several awards and competitions. Members in this group have interest and great passion for programming, engineering, networking and art.

1. Winner of computer assembly competition by FME National ICT Week 2020.
2. Second position winner of scratch programming competition at the FME ICT Week 2020.
3. Second position winner of web-design competition at the FME ICT Week 2020.
4. Second position winner of robot game (mBot) competition at the FME ICT Week 2020.
5. Overall winner at the FME ICT Week 2019 championship.
6. Winner of Computer assembly competition at girls in ICT day 2019 organized by UNESCO.

Our team transformed to an FLL team (Robotics/AI club) when the school was invited to compete at the National FLL championship in 2021 and eventually winning the robot game with 420 point and the overall fourth position.

RUBYTECH FTC TEAM

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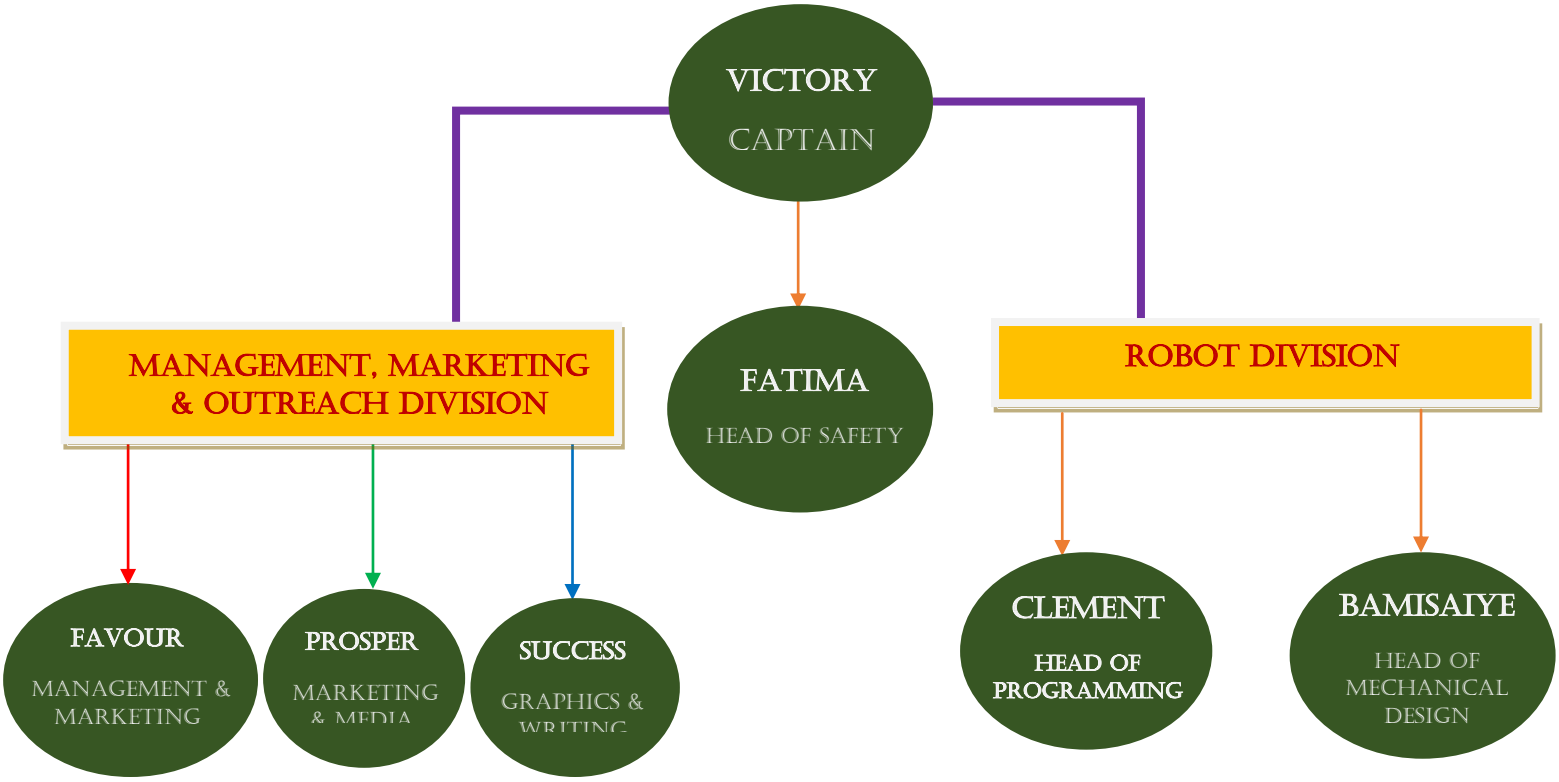
Robot Division

1. Ogbole Gabriel
2. Ebenezer abegunde
3. Odumegwu Clement
4. Bamisaiye David
5. Alameizie Victory
6. Faith Ogundijo
7. Fatima
8. Ogbole Favour
9. Prosper peters
10. Goodluck Ogbole
11. Devine marvelous
12. Obed okenwe
13. Abdullahi Abdulsalam

ORGANIZATION CHART



TEAM BRANDING

TEAM NAME:

Our Team name was coined from two words Rubochi and Machine. Ruby means a precious stone and also stands for Rubochi while machine was taken from the fact that we always build heavy, strong, big, giant, efficient and high performance robot for FLL competitions. We decided to continue to use the name (Ruby-machine) because of the success of the big machine (robot) at the 2021 FLL national championship, determine to continue building better and efficient machine (robot).

OUR TEAM LOGO:

FGC Rubochi FTC logo is a very symbolic and cultural logo especially to Bagi people of Rubochi and Abuja (FCT) environment. The calabash represents the native people of FCT (Abuja) and Rubochi, while the body of the logo represent robot. The logo is a way of showcasing our culture and technological advancement to the world and not forgetting our heritage.

Team Logo

Team Colour: our team colour is green, we choose green because our school uniform is green check on plain green. This green colour is also evident on our website and Mobile App.

MISSION STATEMENT

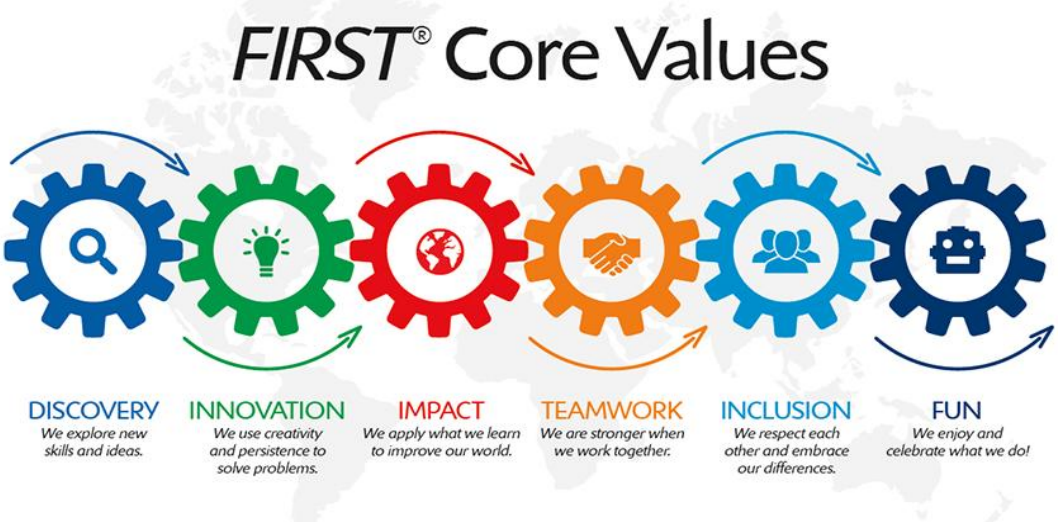
To provide students with the knowledge and skills that will be needed to compete favourably in the global community when they move into college and careers, in order to solve the problems of the 21st Century and beyond. And to propel the name and image of this great country Nigeria. We achieve this by applying the knowledge we got from the school curriculum such as maths, Physics, Chemistry, Biology, Geography, Computer studies and Art and have fun while learning.

Our Vision:

For students to use higher-order thinking skills and to develop the skills necessary to research, design, produce, and communicate solutions to real world problems, to benefit their future and the future of society. Believing that very soon this great generation we a building will launch our great nation into the space where it will not be the limit but as the starting point for greater development to come.

Our Watch word;

The FIRST Core Values are our watch words



SOCIAL MEDIA

NSTAGRAM: @RubyTechFTC.com.ng
WEBSITE: www.RubyTechFTC.com.ng
Mobile App : To download our mobile App APK go to the website at www.RubyTechFTC.com.ng

TEAM STATISTICS

Initial Number of Members – 10

Current Number of Members – 18

Number of students in JSS1 – 2

Number of students in JSS2 – 2

Number of students in JSS3 – 6

Number of students in SS1 – 1

Number of students in SS2 – 1

Number of students in SS3 – 6

Number of Coaches- 1

Number of Mentors-5

SECTION 2: OUTREACH SECTION

SCHOOL AND CMMUNITY OUTREACH

At team RubyTech we do not just build robot for robot games, but we applied the knowledge we gain in robotics to solve all other technical challenges in real life applications. We try to be innovative and creative by creative so many innovative prototypes such as

1. Smart door for buildings
2. Self driving car
3. Self parking car
4. Smart warehouse
5. Smart water dispenser
6. Smart hand sanitizer

Once every term, during PTA, Visiting and open days we display these projects to students, teachers, and parents (including our FLL and FTC robot design).
Showcasing and we use the opportunity to teach and create awareness about FLL , FTC, its core values, it's events, and the numerous benefits of being a part of the FIRST family.

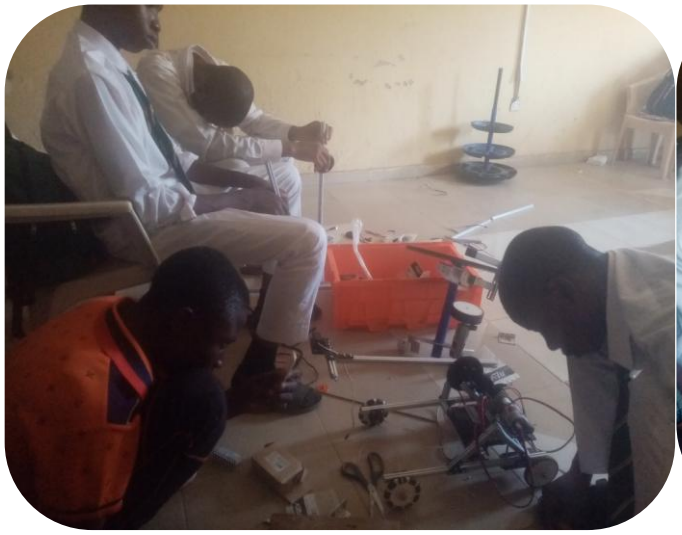
Community outreach; Few members of the team visit other schools such as Living Fountain International school Abuja, Hillside school Gwarimpa Abuja, Apo boys Abuja.
STEM workshops such HighTech STEMTOT 2021, HighTech STEMTOT 2022 to showcase our robotics activities and many other bootcamps.

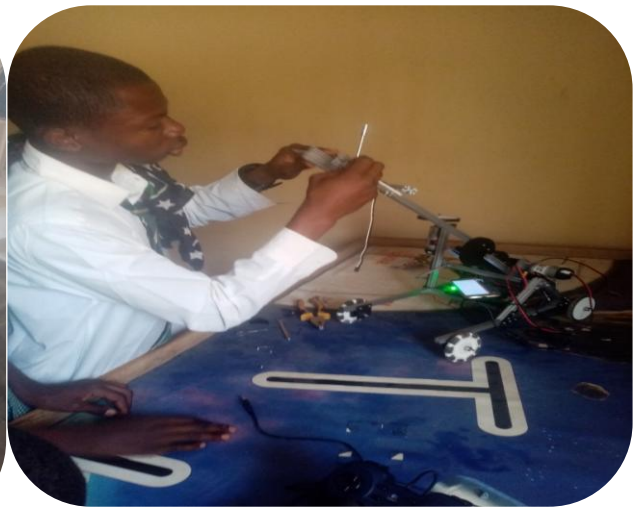
At STEM workshop powered by HighTech STEM, we showcase our robotic exhibitions and introduce them to FLL.

In 2021 RubyTech (FGC Rubochi) team Visited Living Fountain International School Abuja during a summer bootcamp to introduce the students of the school to FLL and FTC.

Few of our team members went to Federal Government College Apo

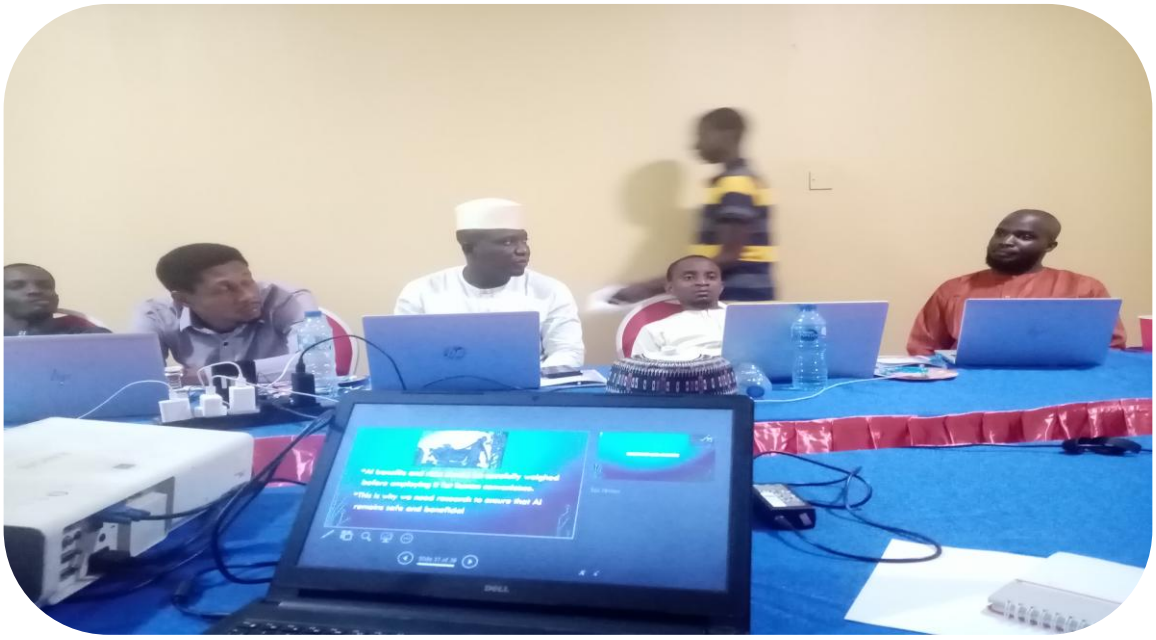
on the 23-24th of Feb 2022 to build FTC robot and to teach programming in order to make the team to be able to compete at 2021/2022 FTC national championship.





FGC Apo boys Abuja

Living Fountain International School Abuja.



HighTech STEMTOT 2021

SECTION 3: BUSINESS SECTION

FUNDRAISING

The team was able to raise the total sum of #15,000 at PTA when we demonstrated to teachers and parents in Dec 2021.

SPONSORSHIP

Support is very key to the development of any organization. We were able to get support from UNITeS ICT Education (Cisco), Coderina. They provide sponsorship. Other supports are gotten from Parents and the School.

How did they come to aid?

We are a team that has being doing great in STEM competitions nationally here in Nigeria. With this impression it was easier to approach them to support us. More impressive was our performance at the 2021 FLL national championship, which the parent and teachers of the school were so happy about.

How we recruit members

We are a team that has being actively involved in STEAM activities for quite a long time, engaging in interesting and eye catching things just as state at the beginning of this book, making it very easy to recruit members.

- Ways of recruitment include;

1. Welcoming interested students
2. Scouting for talented student (when we a student's engaging in creative activities)
3. Catching them young (Approaching Students from Junior classes especially JSS1)
4. Encouraging and allowing as many girls to be members so as to increase the number of girls in STEM.

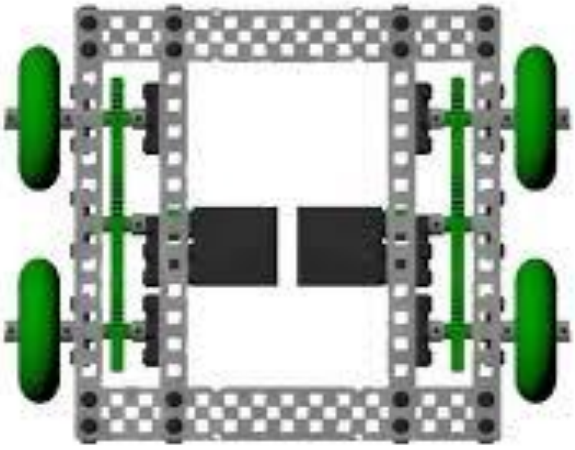
Team Member's training

- New members are introduced to team, exposed to all the team's activities.
- New members are given creative and innovative tasks such as; asking them to create a robot origami, create robots with plastic. This is aim at improving their creative instinct and to provide ideas.
- New members are introduced to scratch programming.
- Regular team members are thought programming languages such as HTML, CSS, Javascript, Spike word block for FIRST spike robot, Op-mode block programming for FTC robot and graphics packages.
- Practice days are Monday, Wednesday, Friday, and weekends for off season meetings and training, while everyday is a practice day after school hours when we are preparing for competitions.

SECTION 4: ENGINEERING SECTION

This section explains in details our robot design processes, sketches, Parts fabrications, Claw design, intake design, our team plan and team meeting log.

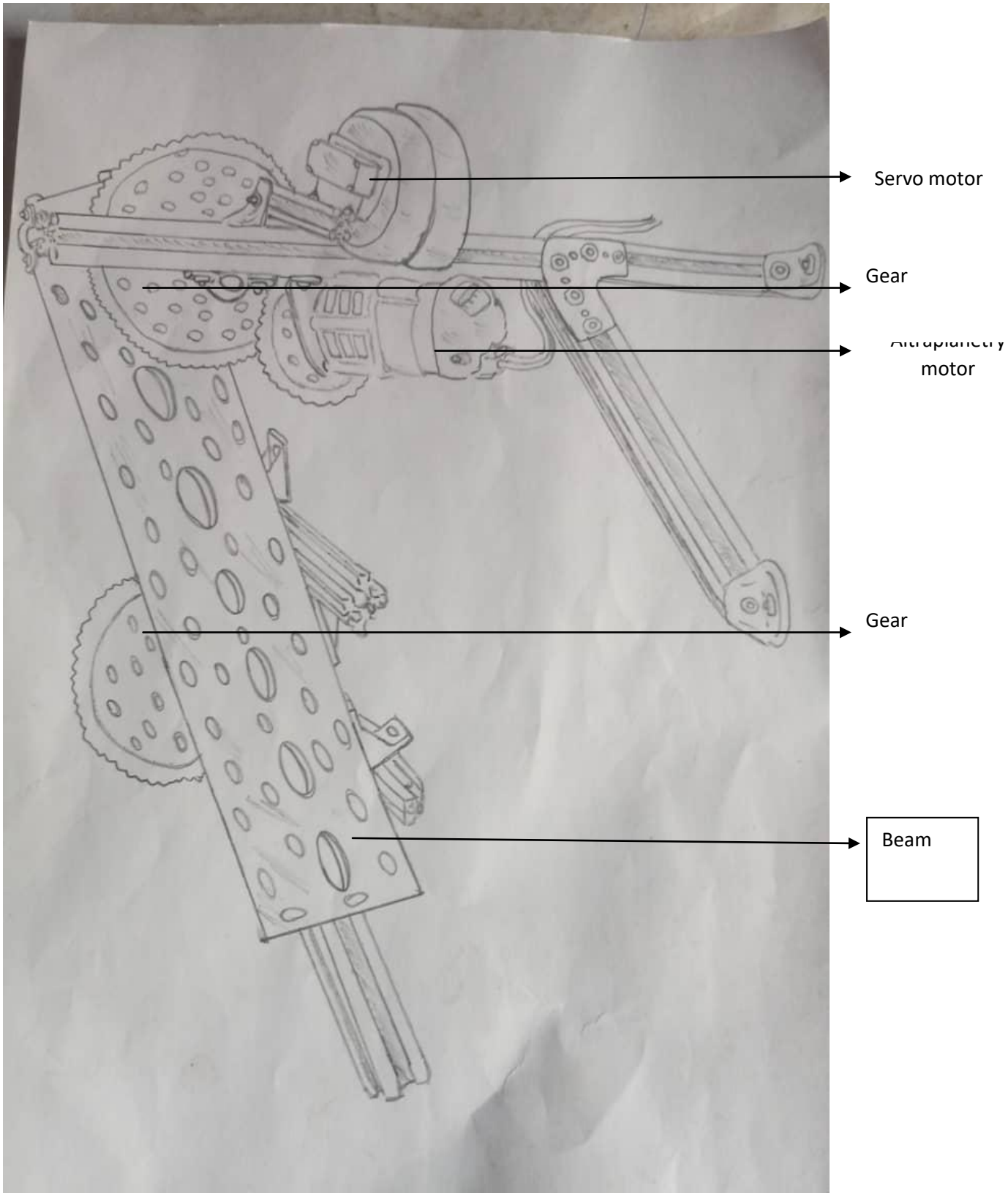
Initial drive base design:

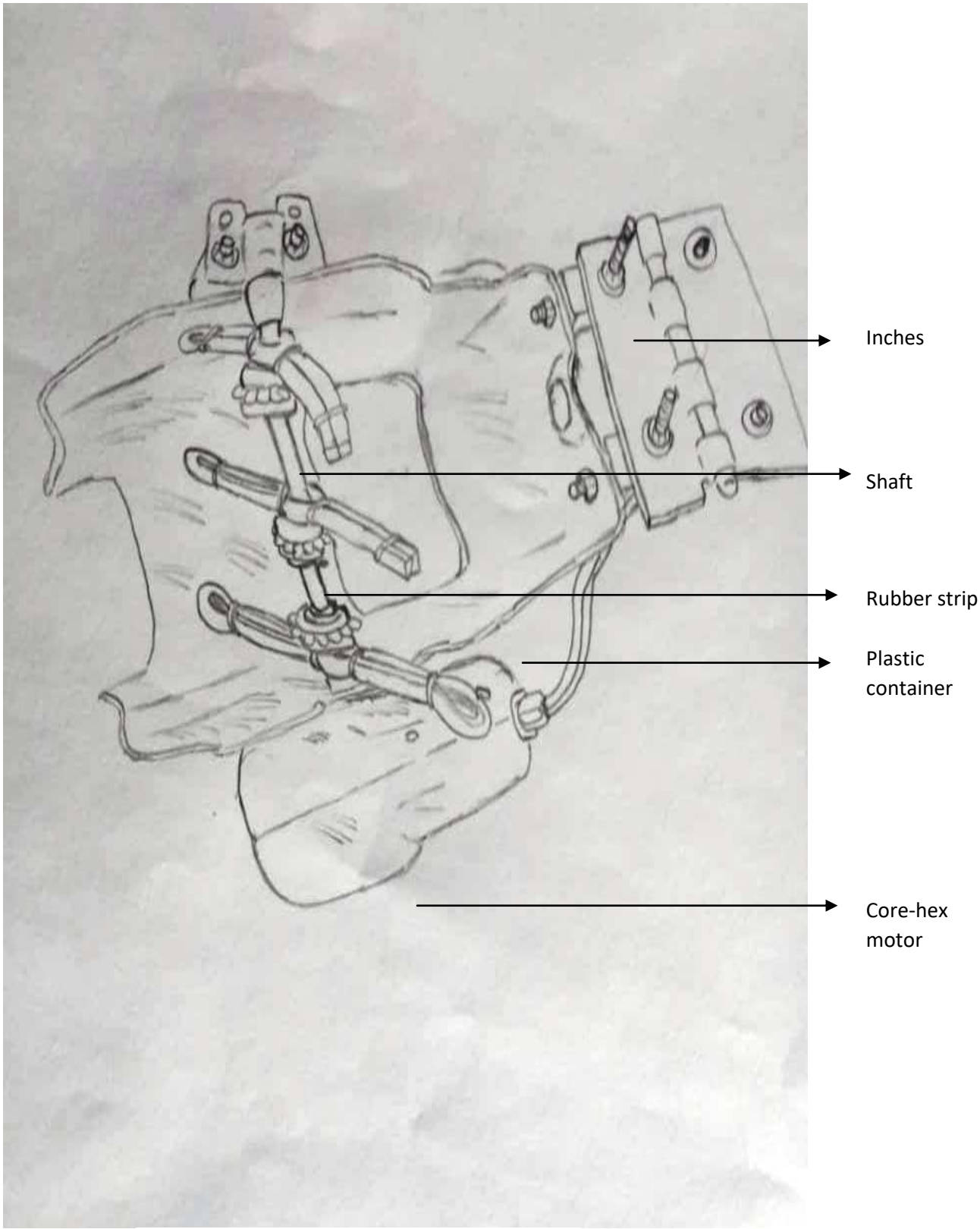


These are the initial drive base that we followed, and designed to enable us practice and get used to FTC kits.

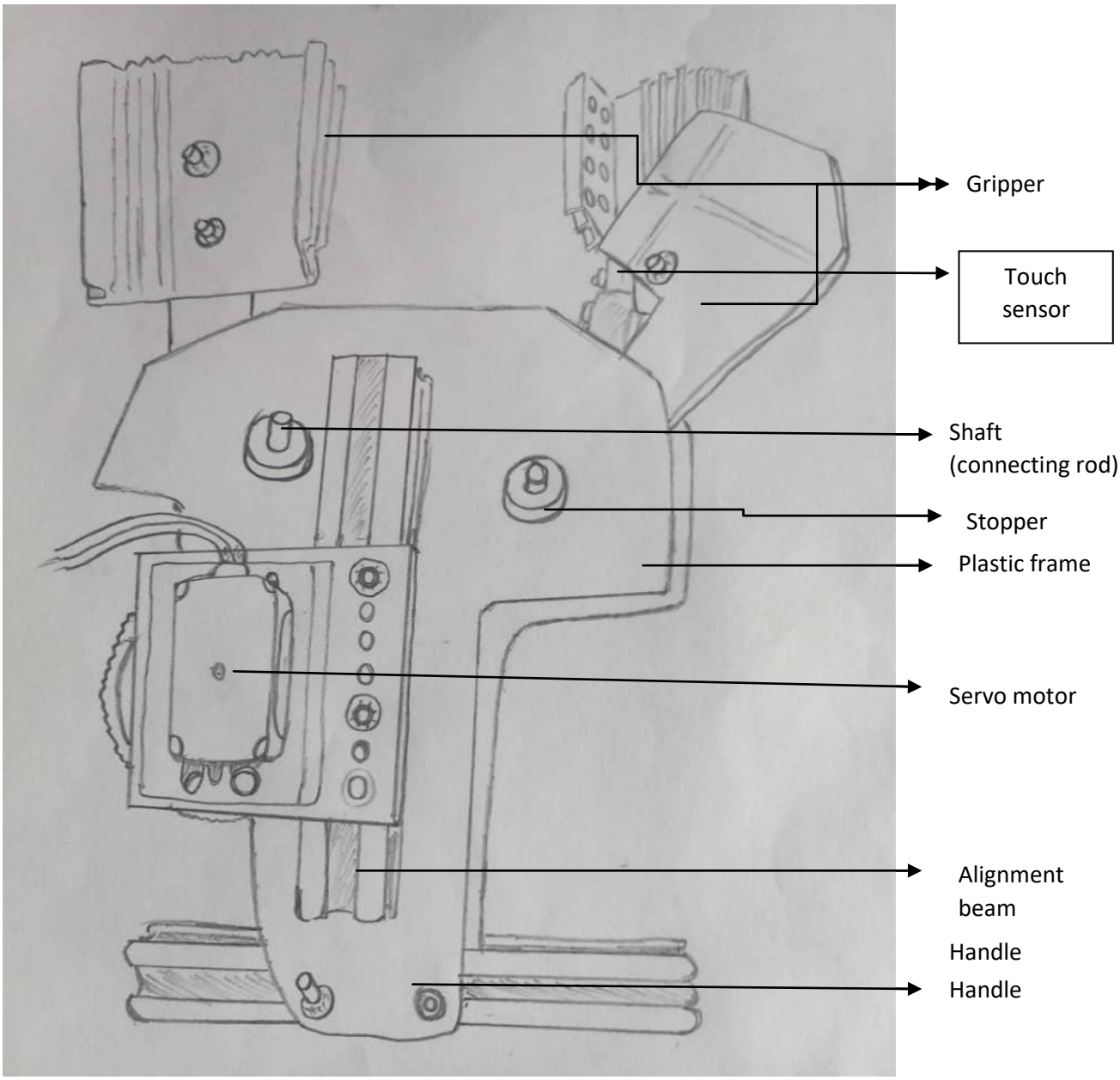
The designs serve as bases and inspiration for a new and final design.

Sketches of our robot for 2021/2022 FTC championship:

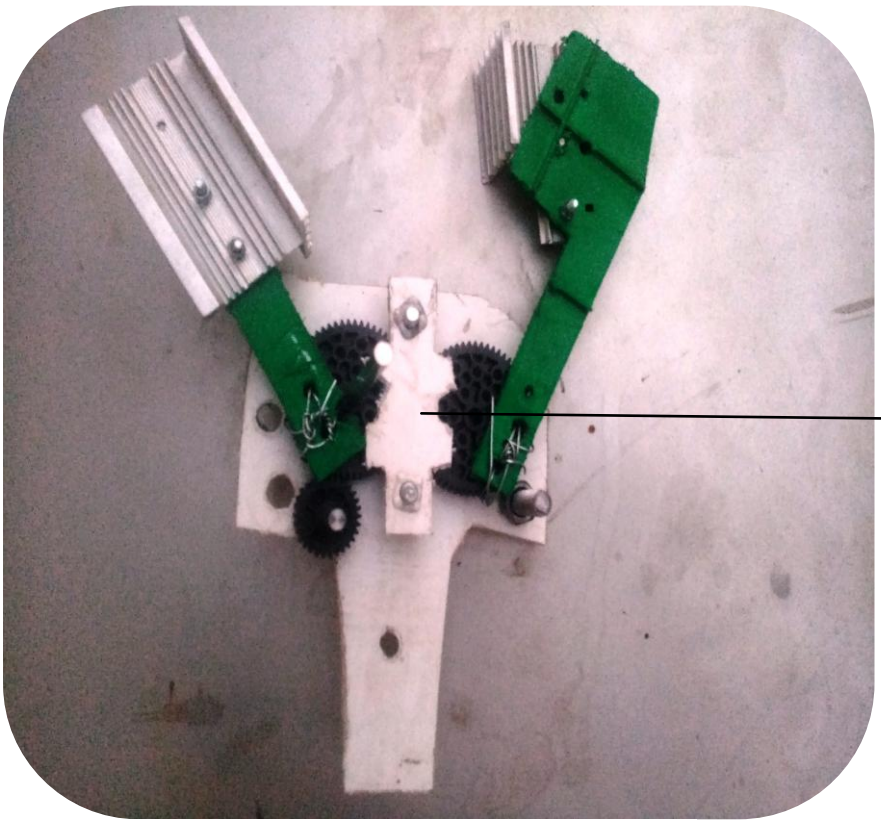




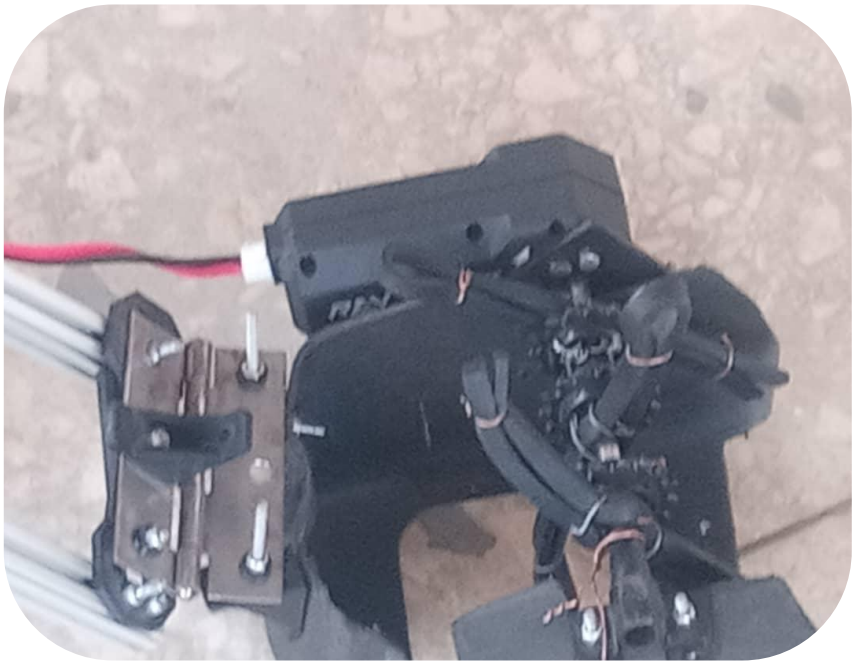
Sketch of a fabricated Intake



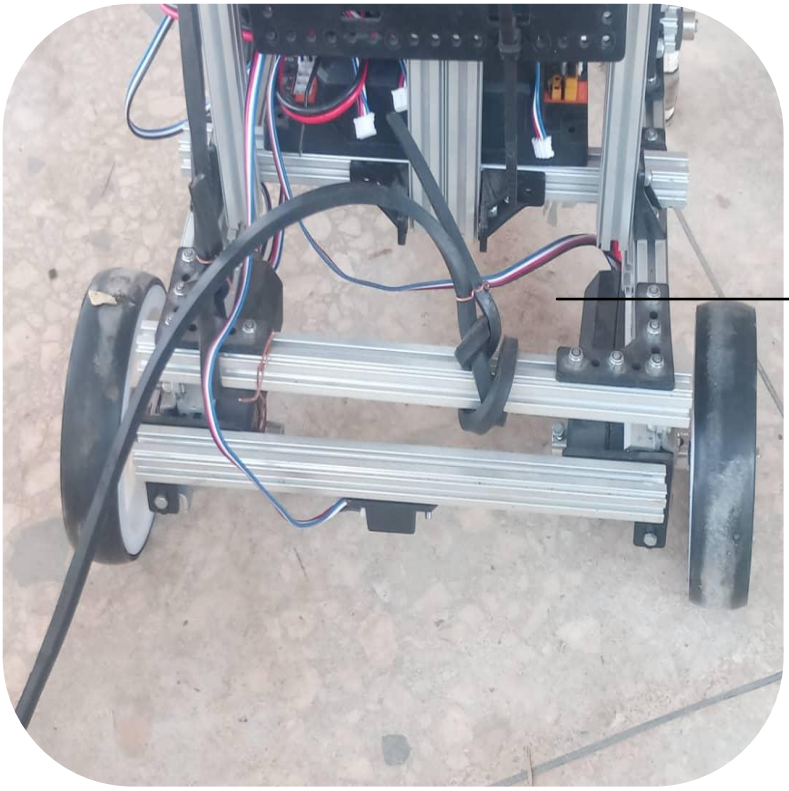
Sketch of fabricated sophisticated claw



Claw assembly



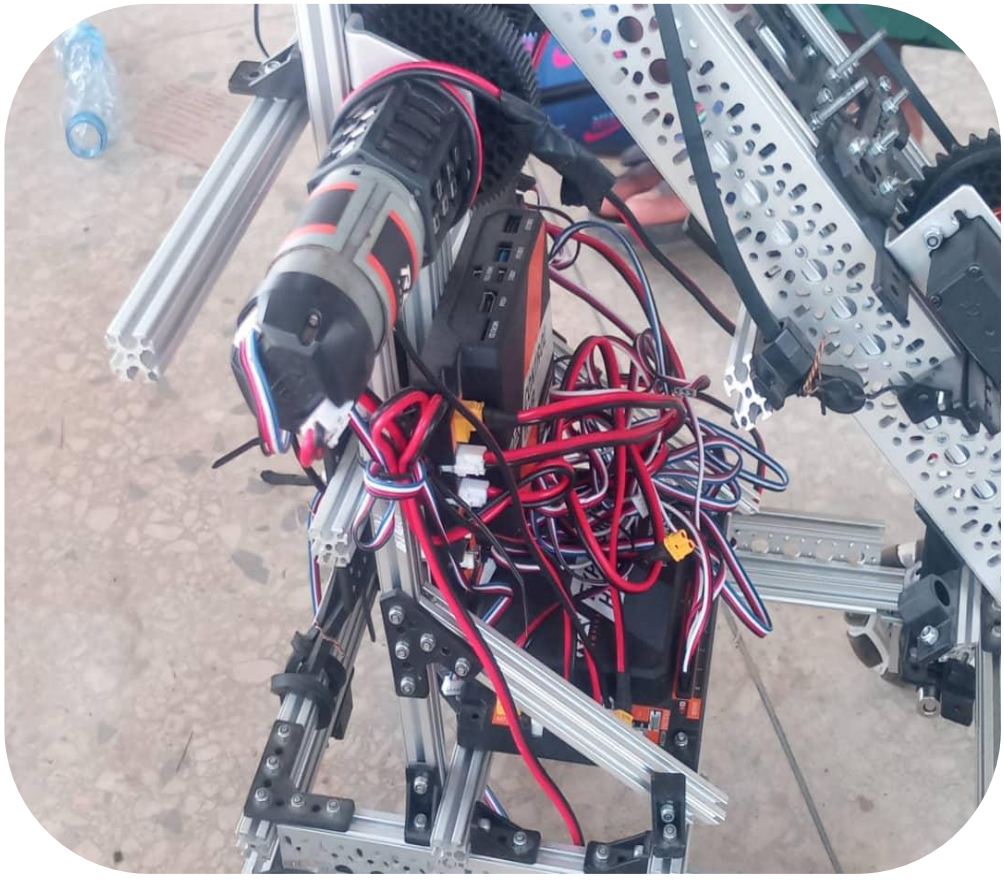
Final Intake design



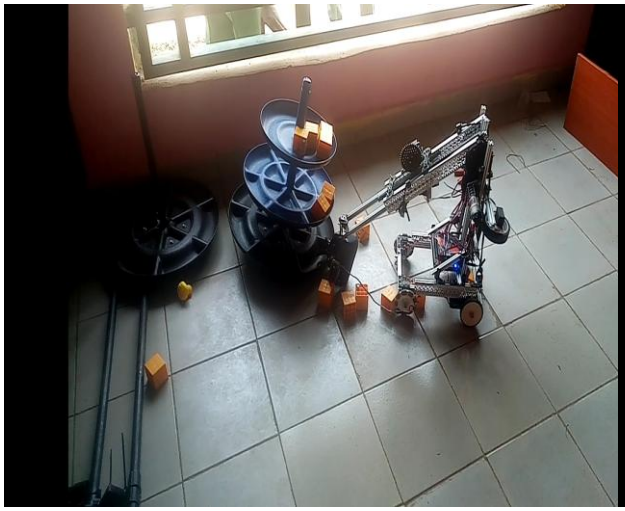
Back view

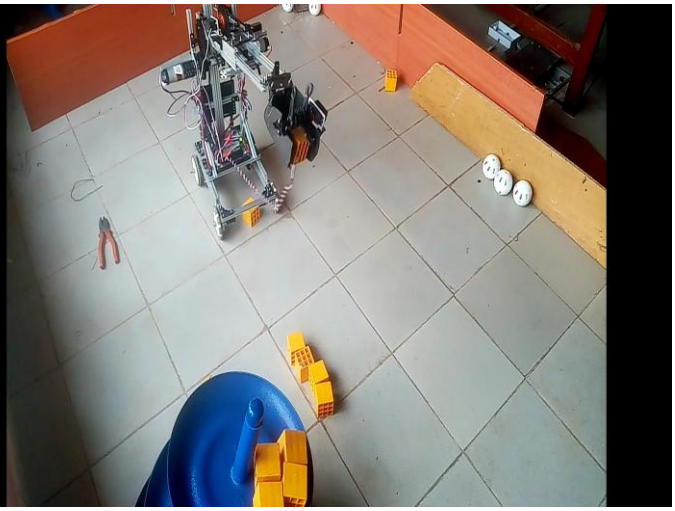
Disc spinner

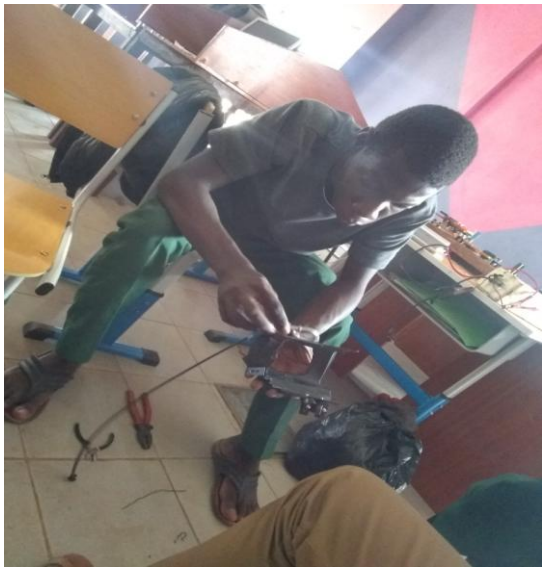
Wirering

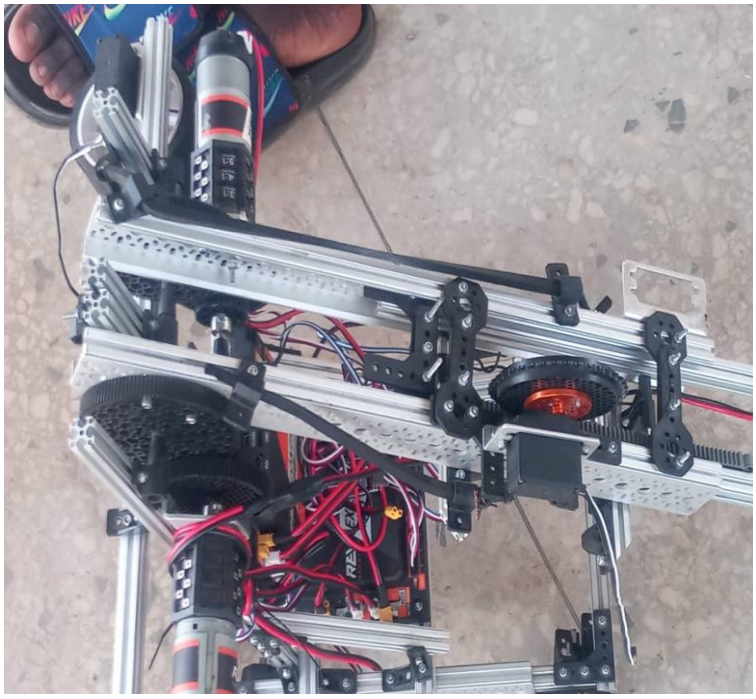


Final Robot Design;









SUBTEAM TASK DISTRIBUTION

Robot Design Subteam

Week 1: Assembling a preassemble robot following manual.

Week 2: perfecting the built robot

Week 4: sketching of new robot with a rear design you can find.

Week 5: Sketch of an Intake attachment

Week 6: Design of an Intake attachment

Week 7: Sketch of a claw

Week 8: Design of a claw

Programming Subteam

Week 1: Intro to op mode block programming

Week 2: Intro to servo programming

Week 3: Intro to motor programming

Week 4: intro to sensor

Week Autonomous programming

Electrical Subteam

Week 1: intro to Current, power resistance and voltage

Week 2: intro to Electrical wirering

Management Subteam

Week 1: Assigning roles

Week 2: Distribution of materials (resources)

Marketing Media/Communication

Week 1: L Branding and logo dsign

Week2 : Social media creation

Week3: Website creation

Week 4: Publicity

Team Plan

Game Plan:
Our game plan is to build robot that is globally competitive, capable of playing the season game effectively. To build robot with a new design and features never seen before. This to push our creative mind to the next level.

Business Plan:
Business strategy is to raise funds from exhibitions. Use such fund in equipping our robotic lab.

Sustainability:
Our sustainability and action plan is to include more junior students into our team, this is to enable them learn from a younger age.

Team Activity Log

DATE	DISCOVERY
07/11/2021- 17/12/2021	To begin, we were first sent the kit and we then designed our base as given in the manual, these includes the tiers. After that was made, we saw that with the base given we couldn't cross over the obstacles, so we thought of a way to solve the problem. We designed another base according to the ideas given by our team members and we began construction. During construction we noticed that the body made was too light which could lead to the robot falling, so we designed another base (which was the third base) and we saw that it was okay in all aspects, both in design and in stability. We added some other parts which made it nice and unique according to our taste and that completed our robot design. In order to make the stretchable hand, we use the rack and pinion method which is similar to an elevator movement and then thought of a mechanism that could be used to bring in and

	take out the yellow cubes and the white balls, we called this mechanism our ‘intake’ we made another mechanism called the ‘claw’, it is used similarly to the intake but the difference is that it held/grabbed unto the yellow cube which stayed firm in its grip, after this was done we decided to try out our game pad, and according to the instructions we were able to catch up to the understanding of how it is programmed during the autonomous time given and we thought the other of our members especially the girls on how to use the game pad.
09/01/2022- 17/02/2022	After returning from the mid-term break given we began continuation of practice with immediate effect, while practicing we examined that the claw could hold firm to the cube but not the same to the balls, so we decided to advance from our claw, replacing it with the intake we improved the stability of our intake, adjusted the speed, practice in movement and in strategy, and with all ideas put together we were able to make a more advance intake with strong holding body which could bring in and take out as stated before with ease and assurance. We used a rubber material in form of a square

	shape as our intake, but while trying it out, it could take in the cubes but the balls would fall out due to the hole beneath it, so to solve that problem with fixed in a rod so as to block the balls from falling while taken in, after fixing our problem we attached it to our robot and added a string to it to enable it hold firmly to the robot. After all had been done we were visited by our principal who have been coming and was checked on to see the improvement and advancement of both the team members and the robot. The rest of the days we had left was to practice continuously to find out on any problem that needed to be corrected on the robot, and while doing that we found out that the rubbers used around the body of the robot were getting weak and so we had to double them to increase their strength while holding the robot

19/02/2022- 27/02/2022	To top everything up, all preparations have been made and our robot have been set for the competition, but we still proceed with practice as to improve our on skills on using the pad.