LIVINGSTON
HIGH SCHOOL

FIRE ROBOTICS BUSINESS PLAN

2025
26

EXECUTIVE SUMMARY

Mission Statement

"FIRE Robotics, rooted in the spirit of FIRST International Robotics Experience, is dedicated to inspiring and nurturing the next generation of engineers and scientists. We strive to embody gracious professionalism and cooperation, connecting with the community and other teams to foster a culture of innovation, teamwork, and outreach."

Team Summary

FIRE Robotics embodies the spirit of innovation, collaboration, and community engagement. Their engineering portfolio reflects a deep commitment to learning, sharing knowledge, and applying their skills to solve real-world problems. Through the building, coding, and designing of Shadow, the team not only competes at a high level but also inspires others in their community and beyond to explore the fields of science, technology, engineering, and mathematics (STEM). Their work is a testament to the power of youth innovation and the potential of robotics to drive positive change.

Program Summary

FIRST® was founded in 1989 to inspire young people's interest and participation in science and technology. FIRST® designs accessible, innovative programs that motivate young people to pursue education and career opportunities in science, technology, engineering, and math, while building self-confidence, knowledge, and life skills.

The mission of FIRST® is to inspire young people to be science and technology leaders and innovators, by engaging them in exciting mentor-based programs that build science, engineering, and technology skills, inspire innovation, and foster well-rounded life capabilities including self-confidence, communication, and leadership.

As Dean Kamen expressed, FIRST is a vehicle for kids to develop a vision, with confidence, and with a sense that they can create their future

EXECUTIVE SUMMARY

Location of the team

Location: Livingston High School, Livingston, New Jersey

Team Impact/Outreach

FIRE Robotics has achieved significant outreach and community impact throughout our season, reaching an impressive total of 19,905 individuals through their extensive outreach and media production efforts. They have surpassed their outreach goal by contributing over 225 hours to community outreach activities, far exceeding the initial target of 150 hours. This includes mentoring three FIRST Lego League (FLL) teams, with two reaching the state conference, and engaging over 4000 people through various events. Their social media platforms and educational content have amassed over eleven thousand views, and they expect their educational videos to reach around 3000 students annually, making them a pillar of STEM education in their community and beyond.

Relationships and Information Regarding Current Sponsors

We obtained 2 new sponsor and one grant this year, raising over $1000 in funds for developing our robot.

TEAM OVERVIEW

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TEAM OVERVIEW

Team History

FIRE Robotics' journey began with a visionary encounter between Marlene Lynn, an FTC mentor from Livingston High School, NJ, and Iris Hamama, an FRC mentor from Arad, Israel, at the International FIRST® Championship in Saint Louis, Missouri. United by a shared vision, they embarked on creating an international FTC team, blending Israeli and American youth. This ambitious project came to life with essential support from the Jewish Agency, Partnership 2Gether, and the Jewish Federation of Greater MetroWest.

The team's inaugural season in 2019-2020, Sky Stone, presented numerous challenges inherent to international collaboration, yet it was a profound learning experience. Despite the hurdles, their debut at the Robo-joust competition in Livingston High School was marked by significant achievements, including nominations for 3 awards and winning the prestigious Inspire Award.

The 2020-2021 season, Ultimate Goal, tested the team's resilience with the onset of COVID-19. Adapting to unprecedented circumstances, FIRE expanded its communication and management systems, focusing on community support, notably by 3D printing masks for civilians and medical professionals.

Entering its third year during the 2021-2022 season, "Freight Frenzy," FIRE transitioned to a domestic team, navigating supply chain disruptions caused by the pandemic. This period of rebuilding saw innovative solutions, such as the creation of 3D printed adapters to compensate for missing parts.

The 2022-2023 season, "Powerplay," marked a significant milestone in FIRE's evolution. Demonstrating remarkable progress, the team secured fourth place in the state, with their alliance winning the league tournament, showcasing the culmination of years of growth, resilience, and innovation.

This concise history encapsulates FIRE Robotics' transformative journey, highlighting their enduring commitment to excellence, community service, and the pursuit of STEM education across borders.

TEAM OVERVIEW

Student team members

FIRE Robotics celebrates the diversity of Livingston High School's student body, with members representing a rich tapestry of races, ethnicities, and cultures. This diversity lends the team a unique global perspective, enhancing their collaborative efforts and innovation. A key objective is increasing female participation in robotics and STEM, with strategies including a long-term partnership with the Women in STEM program at their high school to empower more women and girls locally and globally.

Team Mentors

Guidance comes from a robust mentorship team comprising 4 alumni and numerous teacher mentors, including Mr. Karpack, Ivana Chu, Issac Lynn, and other experts who offer invaluable advice in design, coding, and strategy. Their experience as former sub-team captains and specialists ensures a rich legacy of knowledge transfer, aiding the team in navigating design challenges and strategic decisions.

Team Sponsors

FIRE Robotics has successfully engaged with the community to secure sponsorship, overcoming the initial lack of sponsors to partner with local businesses like C2 Education, Code Ninjas, and significant contributions from Picatinny Arsenal. Their proactive outreach, termed "finance runs," involved team members directly approaching local businesses, leading to the acquisition of 4 new sponsors, surpassing their goal and significantly contributing to their funding and resources.

TEAM MANAGEMENT

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Membership

Membership in FIRE robotics is a school year-long commitment. The membership process begins with an interest form filled out through the school. Following that, prospective members attend several interesting meetings in which they are taught about what FIRST® is as well as how FIRE robotics works together as a team. Following these 'mock' meetings, interested students fill out a formal application to the team. After a thorough review, about 70% of applicants are moved forward to the interviews. The interviews allow senior members on the team to take a deep dive into a potential member's personality, problem-solving, and pattern recognition ability. Finally, based on the interviews, applicants are extended an offer to join the team. Furthermore, if a person is not extended an offer during the interview process, they can come in and volunteer, based on the value they add to the team, the individual may be extended an offer the same or following year to join the team

Team Structure Overview

Fire is almost entirely student-run with 2 Co-Captains responsible for managing the day-to-day running of the team. They are aided by 6 subteam captains responsible for making executive decisions and directing team members in their respective sub-teams. 3 club advisors with backgrounds in Engineering, Marketing, and Finance, assist the Co-Captains with the administration of the team as well as developing necessary documents. Additionally, 4 alumni mentors help the co-captains by dispensing advice on strategies, ideas, and general knowledge on how to run the team.

New members on the team meet existing members and are given a tour of the Tech Lab, including the Workshop, Makerspace, Design, and Education Room.

Beginning with our first meeting, new members are taught basic skills through application-based learning. Everyone on the team learns basic building skills during which all members learn basic building skills. Veteran Build team members work with small groups to ensure a solid core understanding of build principles is taught to all members

TEAM MANAGEMENT

Team Structure Overview (Continued)

After the first few meetings, new members apply to up to two of 6 subteams which comprise Code, CAD, Build, Logbook, Outreach, and Finance. New members attend meetings for their respective subteam to learn more about what responsibilities that subteam entails and are given a period of time to switch or drop a subteam. Following this, more specialized training begins for new members in order to gain proficiency as quickly as possible in their respective subteams. This will continue throughout the year as increasingly advanced techniques and terminology are taught

Team Management Structure Overview

The team is managed by 2 Co-Captains and 6 subteam leaders. Co-Captains are picked by the previous years Co-Captains FIRE team rotates co-captains annually. New Co-Captains are informed of their positions at the end of the season so that they can begin planning for the next. Sub-team captains are then picked by the new co-captains. The sub-team captains of Logbook, Outreach, Finance, Code, CAD, and Build are responsible for making executive decisions in their respective sub-teams, assigning work, making sure deadlines are met, and communicating with Co-Captains

Team Management Structure Deep Dive

Co-Captains - Co-Captains act as the “CEOs” of the team. They communicate the vision for that specific team, and have the final decision on all matters relating to team matters. They are also responsible for giving timelines for completion to subteam captains and ensuring that everything is done up to standards.

Finance - The Head of Finance is responsible for managing the finance team. This subteam is in turn responsible for creating the team budget, developing a team order list for season-specific orders, organizing fundraising efforts with the outreach team, and writing the business plan.

TEAM MANAGEMENT

Team Management Structure Deep Dive (Continued)

Outreach - The Head of outreach manages the team's outreach team. This team's responsibility is to plan, organize, and conduct outreach efforts. These outreaches help market the team, spread FIRST® and S.T.E.M principles, and obtain sponsors.

Logbook - The Head of Logbook is responsible for maintaining the team's logbook throughout the year, and decides who writes the logs for specific meetings. They also finalize the engineering notebook at the end of the season.

CAD - The Head of CAD leads the CAD team in developing a detailed, scale model of the robot digitally. Their responsibilities include teaching new members how to use Fusion 360, developing a 3D digital model of the robot, and 3D printing and/or laser cutting any parts necessary. CAD primarily works with builders to ensure a seamless transition from digital to a physical bot, and supplement the build team with any custom parts.

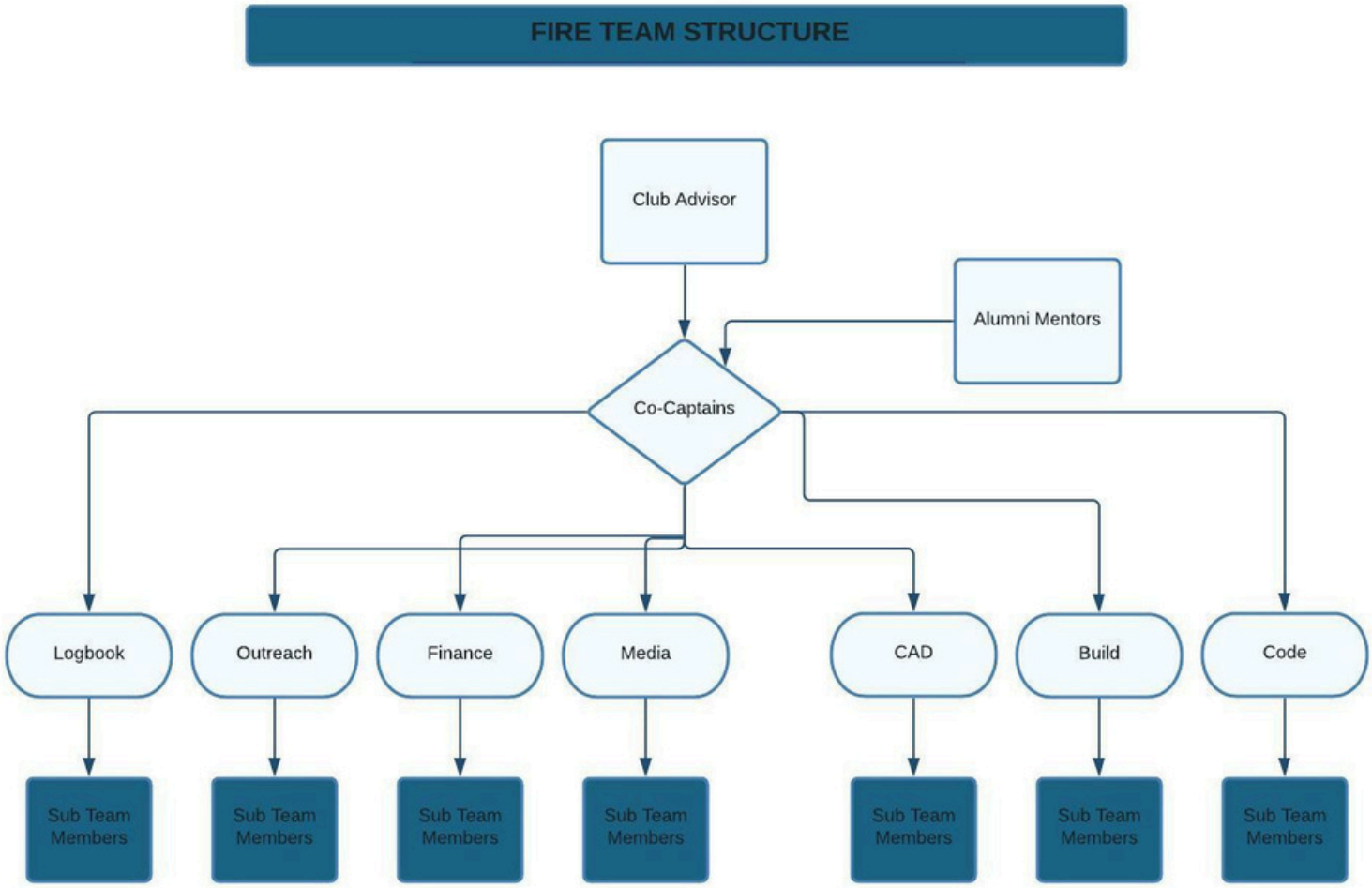
Build - The Head of Build handles the building of the robot. The build team is responsible for designing and building the robot. The build team begins by designing the bot, on paper, and building small prototypes to test their ideas along the way. Then, once a full robot is finalized it is communicated to the CAD team so that the design can begin being visualized digitally.

Code - The Head of Code leads the team in developing the Code for the robot. This team works very closely with the Co-Captains and the Build team to develop the team strategy and convert that to a program that the bot can execute. Finally, the Code team also develops machine learning algorithms and auto-driving capabilities for the robot such that it can navigate the field without human input.

TEAM MANAGEMENT

Team Management Style

The team makes use of an industry-standard multidivisional management structure to ensure the smooth running of the team, even in the absence of several key members.



SWOT ANALYSIS

SWOT ANALYSIS

A SWOT analysis is designed to facilitate a realistic, fact-based, data-driven look at the strengths and weaknesses of an organization, initiatives, or within its industry. The organization needs to keep the analysis accurate by avoiding pre-conceived beliefs or gray areas and instead focusing on real-life contexts. Companies should use it as a guide and not necessarily as a prescription.

TEAM IMPACT

TEAM IMPACT

Team Outreach History

FIRE Robotics has evolved its outreach efforts, significantly expanding its impact both locally and internationally. Originally rooted in the concept of international cooperation, the team has consistently promoted FIRST ideals and STEM education across diverse communities.
Here's an update reflecting the current outreach activities and their broader impact:

Team Outreach

Team Outreach FIRE has broadened its reach, impacting nearly 20,000 individuals through a combination of in-person and online engagements. The launch of the STEM talk show on local TV and YouTube has allowed FIRE to discuss real-world STEM news and inspire the next generation. This platform has also facilitated meetings with other FTC teams, fostering community within the STEM field. Expanded mentoring programs now include three teams: two FLL teams, Team Alph and Team Megamindstorms, and an FTC team, Team Jolly Blue 19823. These efforts highlight FIRE's dedication to nurturing young talent in robotics and STEM. Community-based coding lessons and informational sessions for parents, in partnership with local programming schools and through events with the nonprofit organization Sanskriti, have further solidified FIRE's role in promoting STEM education. These diverse outreach efforts have not only enhanced FIRE's visibility within the community but have also played a crucial role in attracting new sponsorships and partnerships. By showcasing their commitment to STEM education and community service, FIRE has successfully engaged with local businesses, leading to increased support and resources for their projects. The team's innovative outreach strategies, such as the "finance runs," have directly contributed to surpassing their sponsorship goals, securing four new sponsors, and demonstrating a proactive approach to funding and community engagement.
In summary, FIRE Robotics' outreach activities have significantly evolved, now encompassing a wide range of initiatives that promote STEM education, inspire the next generation, and foster a sense of community both locally and internationally. These efforts have not only increased their recognition but have also attracted valuable sponsorships, ensuring the team's continued growth and impact.

TEAM IMPACT

Fire Robotics Outreach by the Numbers

Fire robotics has always been committed to spreading Gracious Professionalism and other FIRST ideals in our interpersonal, school, townships, and global community. We are committed to working towards a better future for everyone, by bringing more and more people into STEM.

FIRE robotics has expanded its reach, this year, working with dozens of parents and students in our community to reach out about STEM and robotics.

TOPIC	NUMBERS	WHAT WE DID
Community	20,000+	• Explained the benefits of robotics • Educated in the field of engineering
Outreach hours	250+	• Volunteered for non-profits and educated youth
Raised	4000+	• Raised more than 3000 dollars for buying parts

FUTURE GOALS

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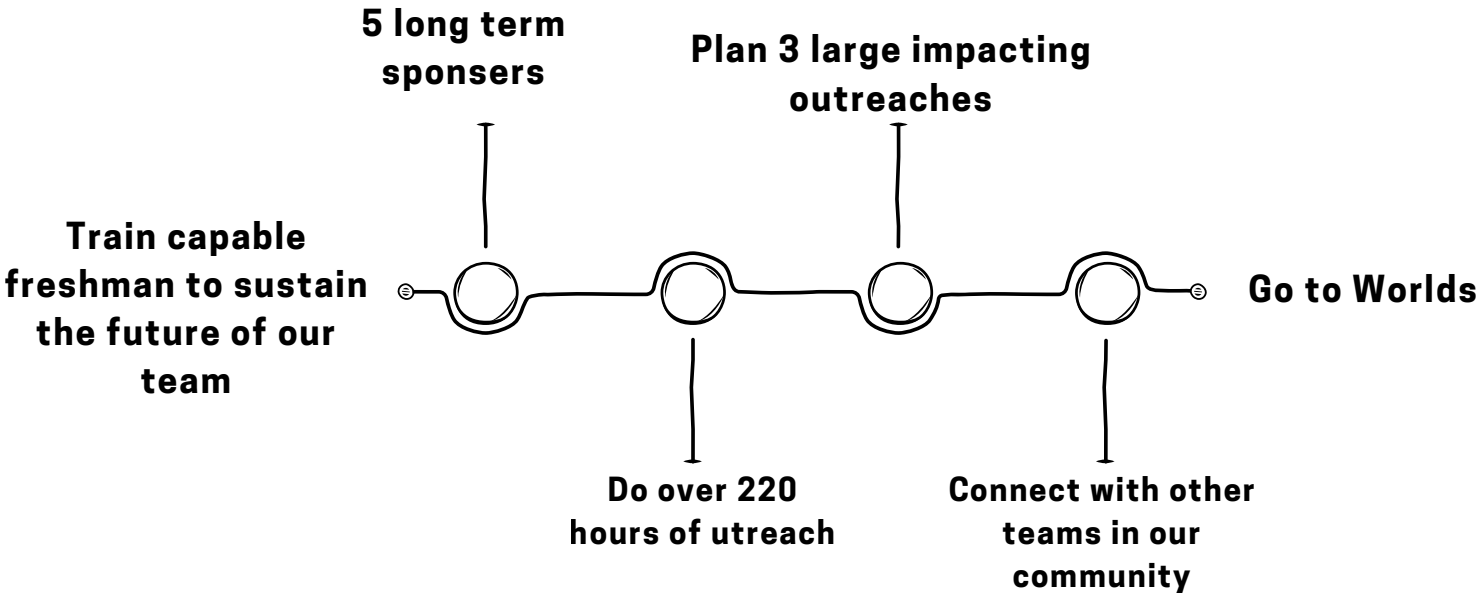
Future Goals

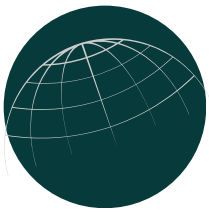
FUTURE GOALS TIMELINES



In order to maintain constant advancement, FIRE robotics has always and will continue to set extremely ambitious long-term goals.

IMPLEMENTATION PLAN

Our Implementation plan outlines how we would work to achieve our goals. We include plans on how to execute the plan and how as well as the build-up in terms of preparation that needs to be done in order to achieve the goal. It provides a framework for the team to advance.



01 — Complete Major Outreaches

Hosted an "Hour of Code" event with over 100 elementary students. We taught them multiple skills including CAD, Block coding, and demonstrated our robot to increase interest in both the FLL and FTC

02 — Financial Independence

Develop a stable, repeatable finance strategy to move off of student donation. We plan to do this by Developing a reusable sponsorship package and developing strategies for a yearly based sponsorship package.

03 — Qualify for the World Championships

Qualify for the 2025-2026 FTC world championship. We plan to do this by exemplifying FIRST principles and learning STEM skills to develop an EXEMPLARY robot that will preform as well as we expect it to.

TEAM BUDGET

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Income

INCOME STREAMS

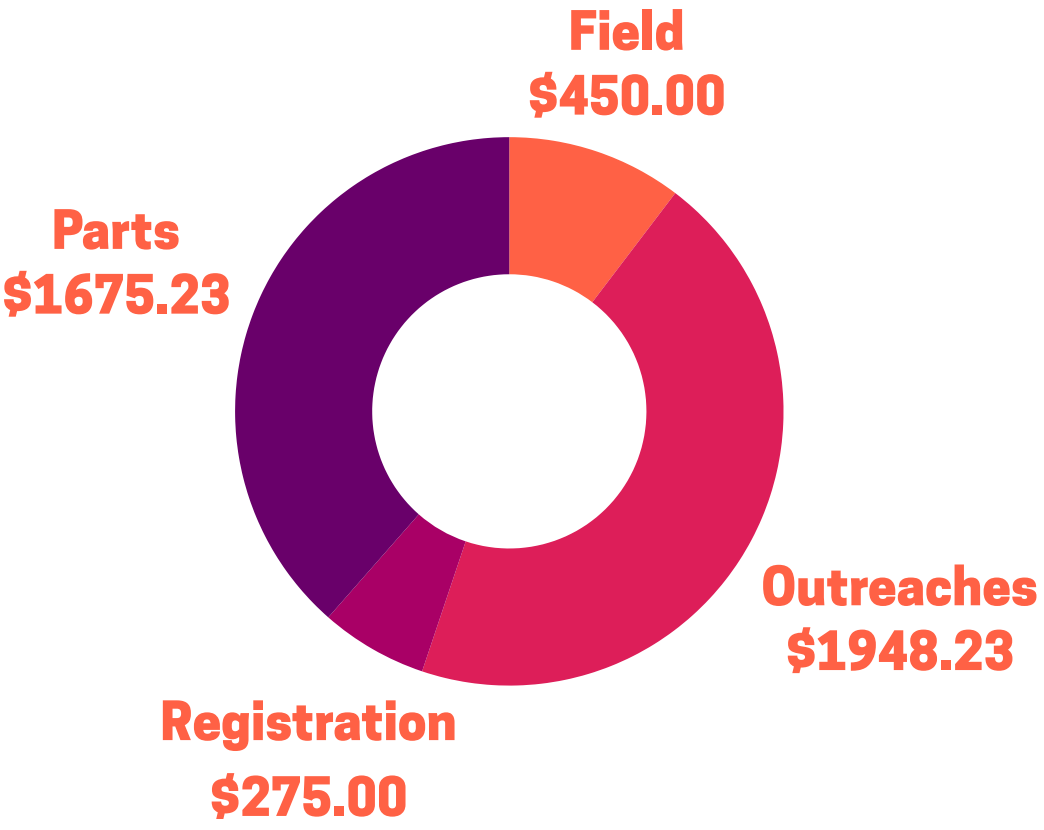
How FIRE funds the team.

FIRE robotics has several consistent and one-time income streams that continue that operate year-round. Sponsorships with companies as well as grants from large organizations, such as the Department of defence, make up a bulk of FIRE's income. We aim to develop a

Expenditure

COSTS

How FIRE spends funds.



The expenditure summary for FIRE Robotics during their notable season includes a strategic allocation of funds towards both operational and outreach activities, ensuring a broad impact and fostering growth in STEM education.

FUNDRAISING

DONOR ACKNOWLEDGEMENT

FIRE Robotics values every type of support. In order to connect with our community as much as possible, we have developed a tiered sponsorship structure where **each successive level includes all the perks of the previous tier**. FIRE Robotics is thankful for previous sponsors who have helped us this past season. For this reason, we have decided to give all past sponsors the choice to support us again this season, **at the same rate as the previous season**. Meaning reduced costs with the same benefits.

SPONSORSHIP	RANGE($)	PERKS
Bronze	250-499	• Logo on team websites
Silver	500-699	• **Medium-sized sticker of company's logo on the robots**
Gold	700-999	• Company logo on the back of our team t-shirt • Prominent branding on team robot
Platinum	1000-2499	• Company Branding at community events • Logo on flyers handed out at competition
Title Sponsor	2,500+	• Company Branding at all major events and on all social media platforms • All Previously metioned benefits

FUND RAISING OPPURTUNITIES

Outreaches

Events like the Livingston Chinese Culture Day and the annual 4th of July celebration allowed FIRE Robotics to engage directly with thousands of community members. By demonstrating their robot and explaining FIRST principles, they not only intrigued the public but also showcased their technical prowess and commitment to STEM education. These events served as platforms for the team to interact with local businesses and community leaders, including members of the Board of Education, fostering relationships that have potential for future sponsorships.

Sponsors

Local Business Engagements: Successfully partnered with businesses like Best Care Dental Service, and C2 Education, and received significant support from Picatinny Arsenal, demonstrating the team's effective community engagement and sponsorship acquisition strategy.
Innovative Fundraising: Introduced "finance runs," directly engaging local businesses and surpassing the initial sponsorship goal by obtaining 4 new sponsors, showcasing the team's proactive and innovative approach to funding.

Donations

Community Support: The team's outreach and engagement efforts have not only garnered financial support but also cultivated valuable mentorships and partnerships, underscoring their impact beyond robotics into broader community development and STEM advocacy.

FINAL STATEMENT

FINAL STATEMENT

Fire Robotics is a community-oriented team set on continuing to develop our skills and our relationships in order to give back to our community and succeed as a robotics team.

CONTACT US

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