

6328

MECHANICAL ADVANTAGE

LITTLETON, MA

*FRC Business Plan
2021-2022 Season*



Mission Statement

“With a robust trunk, lengthening branches, and deepening roots, our 6328 family tree thrives in the larger ecosystem, providing shade for generations of saplings to come.” - 6328 Guiding Principle

Mechanical Advantage 6328 is a community-based *FIRST* Robotics Competition team that prepares 4th-12th grade students in all area communities and schools to pursue interests in science and technology by forging partnerships of mutual respect with mentors, parents, sponsors, and our community. We focus on collaborative learning within the team and within our larger community to build confidence and skills in teamwork, leadership, accountability, and communication as well as technical and business work skills using the real-world engineering projects of *FIRST* robotics. We aim high, believe in open source work to benefit everyone, and see ourselves as a family.

Team History and Growth

Our team has grown exponentially since its 2017 rookie season largely due to our successful FLL-to-FRC transition program, extensive community outreach, and targeted marketing efforts. In our first season, we had 11 students (half of whom were seniors) and 5 mentors, creating a major need for continued growth to be sustainable in future seasons. Our team now has 37 students representing 9 schools and 13 dedicated mentors (and more helping on occasion), with team membership holding steady for the past 2 years. In order to ensure this sustainability, our team emphasizes the passing of knowledge to newer students, who will one day fill the shoes of our student leads.

In addition to growth in team numbers, our team has made major strides with our community outreach. As firm believers in the idea that a rising tide floats all boats, we founded the Open Alliance along with 5 other teams in 2020 to break the current barriers of team secrecy and confidentiality and help show the *FIRST* community another way to openly share ideas and resources. Through the Open Alliance, we made public all of our CAD, software, and scouting data during the 2020 and 2021 seasons. Our 2021 Build Thread received well over 51,000 views on Chief Delphi. The growth of the Open Alliance to nearly 40 teams for the 2022 season supports our team sustainability by building our brand and reputation as a team looking to support the community however we can.

Our total outreach has grown from 67 person-hours in our rookie year to nearly 4000 person-hours in 2021, with a nearly 100% increase over the past 2 years with annual events such as fairs on the town common, trunk-or-treat, and touch-a-truck events, and unique events such as Waterfire in Providence RI (where we organized 15 *FIRST* teams at the 2019 event with an attendance of over 100,000) and Thunder over NH in 2021 where we were part of a *FIRST* demo to 40,000 attendees. We also work diligently to be visible in our local community, and have established ourselves as a STEM hub in the area. Because of this, our team sponsors have grown from 5 in our inaugural year to an average of 20-25 major sponsors each year. Our community outreach is what connected us to our largest sponsor, Patriot Beverages, who provides us with a dedicated workspace. In addition, we continue to maintain strong relations with local municipal governments and spent more than 60 hours in 2021 advocating for STEM education funding at the state and national level.

Organizational Structure

Our student-led team is organized under 2 student Captains (one for the Business Team and one for the Technical Team), and 8 subteam student leads. Our Business Team and Technical Team captains act as project managers and leaders in their respective areas, and oversee the rest of the subteams. Students lead subteams of CAD/Design,

Mechanical, Manufacturing, Software, Strategy, Awards, Marketing, and Outreach. Our executive committee of 5 core mentors helps guide and oversee team operations, and we have a full complement of 13 dedicated mentors for day-to-day meetings, plus additional mentors who contribute on individual projects or as needed.

Students choose which subteams they would like to work with and may choose as many as they are interested in, whether it be technical or business, though all students are required to participate at some level in both the technical and business side of 6328. We believe this requirement is truly fundamental to how our team functions - it unites all aspects of our team to demonstrate to students that one aspect is not “more than” another, that both business and technical work are equally foundational to a successful team, and gives students exposure to all areas of *FIRST* and the engineering process, including project management and budgeting.

We welcome students to our FRC team starting in 8th grade, and most come to 6328 through our highly successful FLL-to-FRC Transition Program, started in 2017. Our FRC students are FLL coaches and mentors, giving the older FLL students a familiar face to help them transition into the FRC program and increasing our student retention rate. Five years into the program, 68% of our FRC students came through the FLL-to-FRC Transition Program. As the former FLL students gain FRC experience in a variety of subteams, they are encouraged to apply for student leadership positions. When they become experienced students, they help pass on their knowledge to newer students. This cycle of continuously and effectively passing on institutional knowledge to the next set of students is part of what makes our team structure sustainable.

Risk Analysis

Our team’s greatest strength is our dedicated group of mentors. We have mentors with all types of skill sets to help both the technical and business aspects of our team. Along with dedicated and supportive mentors, we are truly grateful for our community support. We have gained name recognition in our town which helps us to recruit more sponsors and engage student interest. Our relationships with our sponsors is how we cover team expenses.

A current weakness on our team that we have noted is the high number of newer and inexperienced students on our team, largely due to COVID restrictions over the last two years. With over half of our team being new to FRC, and two-thirds of our team having never attended an FRC event, there is a larger reliance on experienced students than we would like. Although this is a weakness, it is also an opportunity for team growth as the newer students who are currently inexperienced will eventually move on to fill the shoes of currently experienced students. Because of this prospect, our team holds great potential for the future. Our focus on sustainability ensures this happens, with experienced students focused on passing on knowledge to newer members, even if that means slowing down work output.

Our relationship with our community allows us to host and participate in community outreach events. This opens our team to further opportunities for new team members and sponsor recruitment, as well as engaging younger members of the community. Our community relations has helped us secure many sponsorships including Patriot Beverages, who provide us with our workspace. Another opportunity is our strong FLL-to-FRC transition program, and our training programs. These programs help educate students and grow them into capable leaders. In addition, our connections with colleges such as WPI and Tufts University help build a strong alumni mentor network for our team.

As with many other teams, COVID has been a threat to team operations, as we have been forced to decrease our number of in-person outreach and fundraising events such as our annual Pasta Dinner for our sponsors and our summer Third Thursdays to connect with our community. The economic impact of COVID has also contributed to

recent difficulty in sponsor recruitment. To address this, we executed a strong sponsorship campaign in which we had students email a total of 55 potential sponsors.

Marketing

Littleton Robotics actively brands and markets all our robotics programs, including FLL, through activities such as:

- Maintaining an active presence across a variety of social media platforms, including Facebook, Twitter, Instagram, and YouTube
- Advertising the *FIRST* and Littleton Robotics brands at all our outreach events
- A new partnership with Littleton's Parks and Recreation department to publicize the FLL programs
- A new partnership with Girl Scouts of Eastern Massachusetts to provide robotics badge programming open to all Girl Scouts in the Greater Boston area
- Working with local school districts to let student populations and families know about FLL opportunities
- Established relationships with local media (cable access, local news media and websites) as outlets for press releases, flyers, and other publicity materials

Our social media posts keep followers updated on team operations and engage potential sponsors, and our build threads on Chief Delphi are very popular on the platform. As a founding member of the Open Alliance in 2020, we firmly established ourselves as a reputable team within the *FIRST* community, and partnerships with local news media networks and websites have established our name within our local community. Actions such as collaborating and sharing resources with local teams and sending care packages to rookie teams in our area strengthen our presence within the local *FIRST* community. In addition, our emphasis on community outreach, including our FLL program, draws in new students to our team every year.

Financials

As a community team, we don't have the backing of a school system and have to find our own funding through sponsorships, donations, grants, activity fees, and fundraisers, such as our Home Court Advantage Raffle which profits around \$3,000 annually. We take pride in our sponsor retention rate, including 5 major sponsors who have been with the team since our rookie season. For the last two years, we have run a Sponsor Outreach Program, initially developed by one of our student leads, which teaches students how to craft an outreach message and walks them through the process of approaching potential sponsors to make an ask, either through email or in-person at outreach events. Potential sponsors are very engaged when they hear directly from the students benefiting from their support, and we continue to engage with them through the season with newsletters, demos, thank you posters, and (pre-COVID) our annual pasta dinner and Open House. Sponsors are recognized in the community on our website, social media, team apparel, and on the robot itself. In addition to sponsorships, we keep a running list of grant opportunities. Students can meet some of their fundraising goals by applying to grants. We also collect an activity fee from students, which can be discounted or waived based on individual financial needs, which forms the foundation of our budget at the start of each fiscal year.

We track all expenses in Quickbooks Online¹ and set our annual budget by reviewing the previous year's income/expenses against known fixed costs, such as registration and insurance. Fortunately we were able to retain many of our sponsors during the 2021 At Home season, when we reused our 2020 robot. The dramatic reduction in spending allowed us to start a multi-year Capital Campaign fund, which has already been used to purchase new shop equipment such as an Omio router.

¹ See profit/loss statement in appendix