

6328

MECHANICAL ADVANTAGE

LITTLETON, MA

*FLL Challenge Business Plan
2021 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

Mechanical Advantage FRC 6328 established our Littleton FLL program in May 2017, following the completion of our rookie FRC season. We had strong interest from local families, especially after our FRC team attended the World Championship in our rookie season.

We started by hosting summer FLL training sessions in 2017 for rising 4th-8th graders. Through 2019, we ended our summer session with a combined FRC-FLL outreach demo at Boston's Greenfest, though that tradition has been put on hold the last couple of years due to the pandemic. This summer program has been highly successful in getting team members excited to participate in the upcoming FLL season and teaching new FLL students the basics of core values, project research, and robot design/programming. Our FRC students volunteer as FLL coaches and work closely with the FLL students at meetings and events.

Prior to the pandemic, our Littleton program grew to five in-house FLL teams, plus supporting another six FLL sister teams in nearby Bolton, MA. While participation dropped off in 2020 to three remote teams due to COVID restrictions, we are building the program back to meet demand and were able to run six teams between Littleton and Bolton for the Cargo Connect season in 2021. In addition, the Bolton FLL teams were officially brought into the Littleton Robotics/Mechanical Advantage organization in 2021 to simplify financial and organizational planning.

In addition to our FLL program, Mechanical Advantage has a long track record of FLL outreach events, including:

- Hosting an FLL Qualifier (2018, 2019), and hope to be able to host again once COVID restrictions are eased
- Core mentors serving as FLL Challenge Judges and Judge Advisor for FLL Massachusetts events (2018-2021)
- Hosting Practice Interviews Day for any local FLL Challenge teams (2017-2021)
- Participate in 1100 Test Drive Scrimmage at Algonquin High School (2017-2021)
- Participate in Bolton-Littleton FLL Challenge Scrimmage at Florence Sawyer School (2017-2019)
- Host FLL Explore Expo events (2018, 2019)

Our successful FLL-to-FRC Transition Program for 8th grade FLL Challenge students, with organized activities and mentorships to transition FLL students to our larger FRC program, has provided a steady stream of new FRC students who are already familiar with *FIRST*'s programs and helps to ensure overall program sustainability for the long-term. Currently, 68% of our FRC team are students who have come through the FLL-to-FRC Transition Program.

Organizational Structure

Our Littleton and Bolton FLL teams are separate organizational and financial structures within Littleton Robotics, the 501(c)3 organization behind Mechanical Advantage FRC 6328. Each FLL program is managed by its own Head Coach(es), who also work together to coordinate curriculum and events. Each individual FLL team then has its own coach(es) and FRC student mentors who are FLL alumni themselves. The Littleton FLL program additionally provides three overarching student mentors, each of whom is responsible for overseeing one piece of the core FLL program (Core Values, Robot Design, and Innovation Project) to ensure all FLL teams are making progress in that area and to coordinate any cross-team work and activities.

In addition to the coaches and student mentors, we ask FLL parents to contribute or volunteer in some meaningful way to support the teams. Opportunities to contribute can range from providing snacks to securing a sponsor to providing additional adult supervision at meetings.

Short and Long Term FLL Program Goals

Short term goals for the FLL programs include:

- Grow FLL program participants to approximately 50% female/nonbinary students
 - We are working with the Girl Scouts of Eastern Massachusetts Council to present three Robotics Badge programs in May 2022 using FLL robots, introducing female students from all over Eastern Massachusetts to the FLL program.
- Restart the summer FLL program in Littleton that was suspended during 2020 and 2021 due to COVID
 - Used to introduce new students to FLL robots and concepts
- Institute FLL Interest Days in Spring 2022 to introduce potential FLL students to the program
- Raise funds to purchase 4-6 additional robots and laptops for FLL team use

Long term goals for the FLL programs include:

- Year-round FLL programming
 - Requires finding an alternate meeting space and mentors during the FRC season
- Increase student retention
 - 60% of FLL students return for the next FLL season
 - 50% of 8th grade students continue with FRC or another high school robotics program
- Add outreach programming, such as a BSA Robotics Merit Badge Day, restarting our GirlUp club, collaborations with the Society of Women Engineers, and a Summer Camp program in conjunction with Littleton's Parks and Recreation Department.

Risk Analysis

Our dedicated mentors are the FLL program's greatest strength. The Head Coaches are experienced and driven to provide a fun and meaningful experience that engages our FLL students and their families. Additionally, the FRC student coaches bring years of their own FLL experience and demonstrate a remarkable willingness to learn how to work with younger students. Along with the mentors, we also are very grateful for widespread community support and engagement.

Sustainability is always the biggest risk, for a variety of reasons. The natural progression of students aging out of the program means that we need to proactively recruit new students every season, both for FLL students and FRC student coaches. We are also highly reliant on just three Head Coaches to run both FLL programs, which is problematic should any of them have to leave the program.

The combination of widespread community support and the need for team sustainability means that we take advantage of outreach opportunities as often as we can. Whether participating in local town fairs in the summer or Boston's Greenfest (pre-COVID). These events are opportunities to demonstrate our program as well as engage with potential new students as well sponsors to help provide the funding for new equipment.

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

Financials

2021 Season Budget - average for each individual FLL team

Income	Amount	Expenses	Amount
Activity Fees	\$900	<i>FIRST</i> Registration	\$375
Sponsors	\$900	Event Registration	\$200 ¹
		Apparel	\$300
		Project Supplies	\$100
Total	\$1,800	Total	\$975

Littleton Robotics changes an activity fee per student for participation, which is reduced or waived if it poses a burden to families. We are fortunate that our FLL program is able to secure employer sponsors through parents and volunteers, which is allowing us to build a reserve to purchase additional LEGO robots, sensors, laptops, etc. for team use in the next year and as the number of FLL teams grows within our programs.

¹ Qualifier plus state championship registration fees