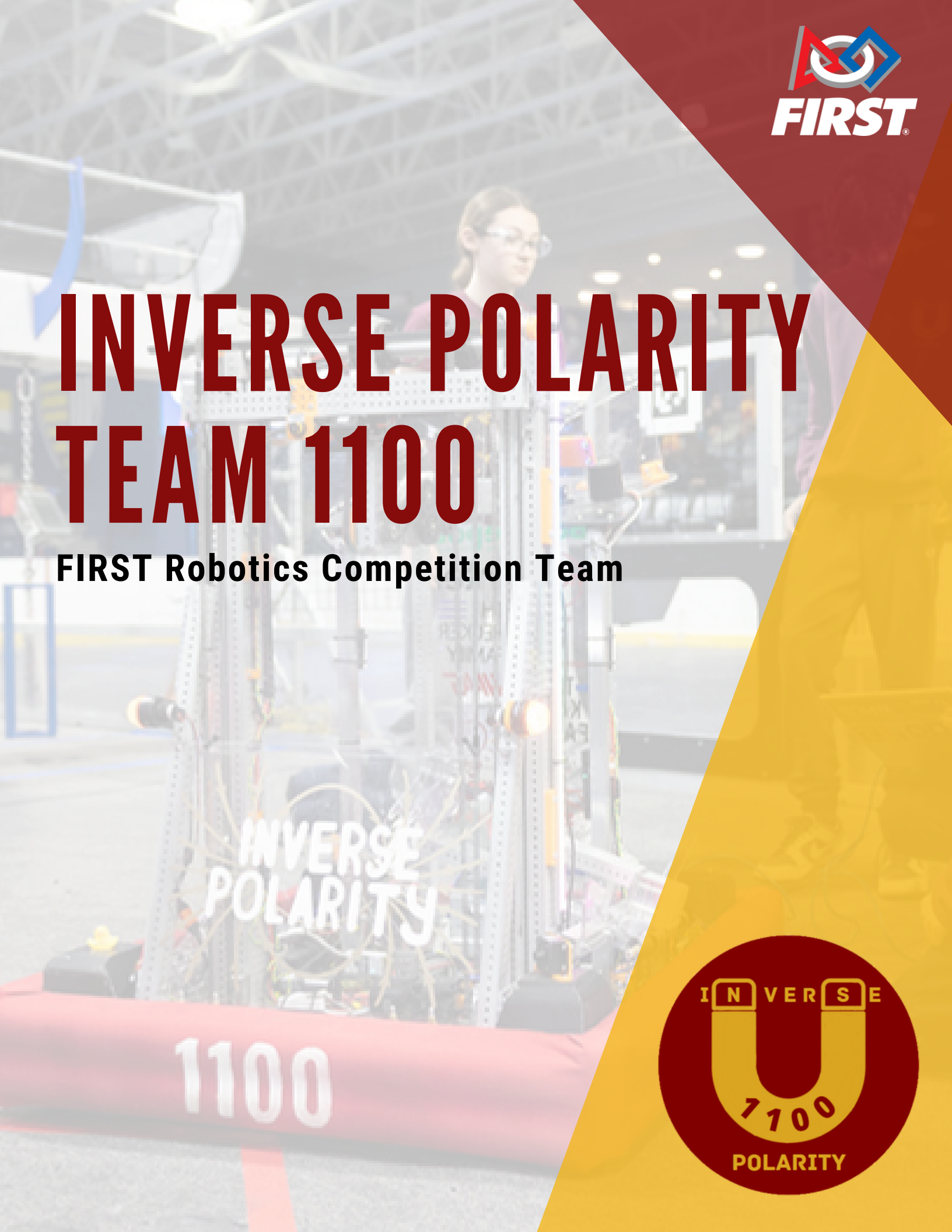

INVERSE POLARITY TEAM 1100

FIRST Robotics Competition Team

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TEAM 1100 MISSION

Through participation in annual FIRST Robotics Competition, FIRST Tech Challenge, support of local FIRST LEGO League teams, and multiple community outreach activities, Team 1100 inspires young people from Algonquin Regional High School and surrounding communities to be leaders in science and technology fields. By engaging them in challenging mentor-guided programs that build engineering and technology skills, we inspire innovation and creativity, which foster well-rounded life skills including self-confidence, communication, and leadership.

HISTORY

Team 1100 is a non-profit robotics team based at Algonquin Regional High School with students from Northborough and Southborough, Massachusetts. Team 1100 was founded in the fall of 2002 and the upcoming 2026 season will be our 23nd year of competition. Inverse Polarity currently has ~50 students and 10 mentors that work together each year to not only build FIRST Robotics Competition robots, but also empower students to become leaders of the future through technical and life skill development.

2002

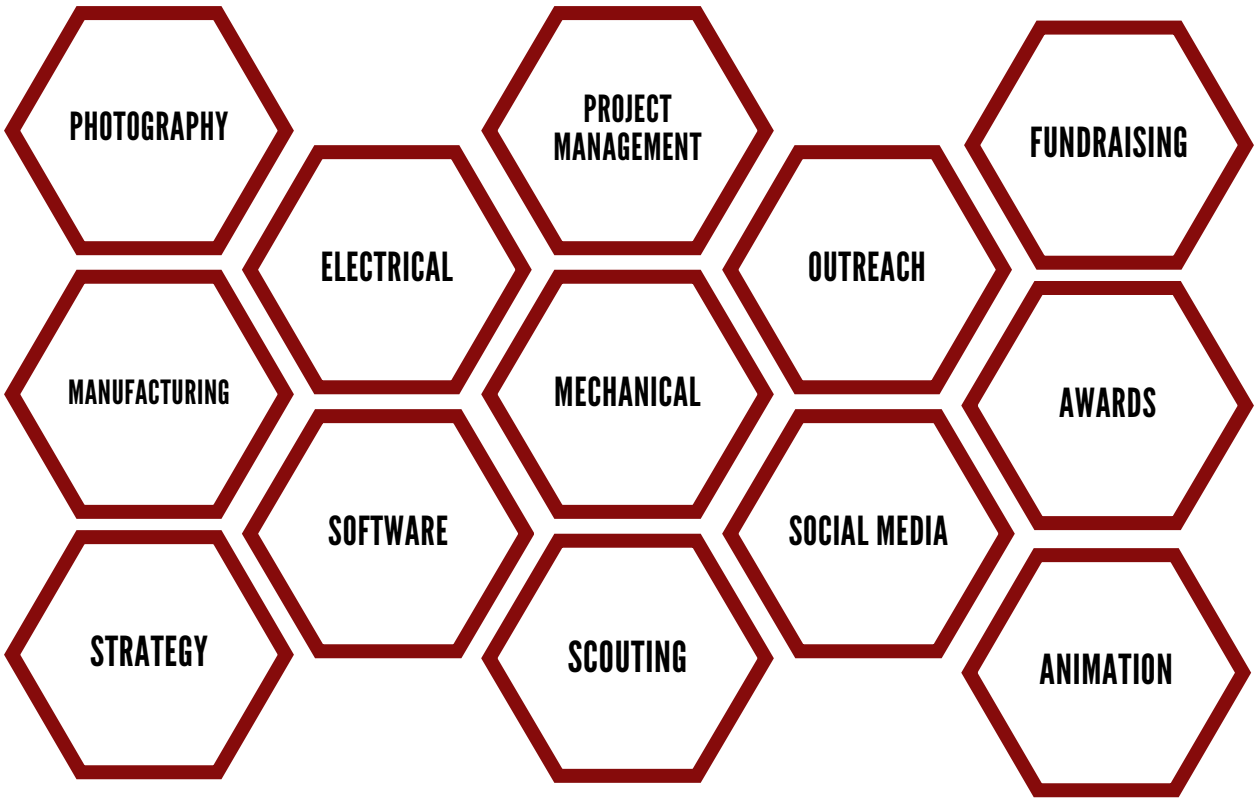
2026

ON OUR TEAM

TEAM STRUCTURE

Team 1100 strives to embody the motto “People don’t build robots, robots build people.” Our members find lifelong friends through the team, gaining crucial life skills in diverse aspects such as public speaking, networking, technical expertise, design, CAD, etc. In the past 3 years, 100% of our alumni were inspired to pursue their passion for STEM in their careers, and many volunteer as mentors and at FIRST events. Currently, 60% of the mentors on our team are Team 1100 alumni.

Team 1100 utilizes post-mortems to gather the team and reflect on our processes to make continual improvements, ensuring that all students and mentors are on the same page. In 2025, the students began a Project Management sub-team, utilizing systems to help organize tasks and timelines. These methods of industry organization productively prepare our students to enter the field as effective communicators and team players, the true core of our motto.



ROBOT DESIGN PROCESS

1. KICKOFF GROUPS

- Groups watch kickoff reveal, then spend weekend developing robot design and strategy for the game
- Team breaks into small design groups of 4-5 students and one mentor

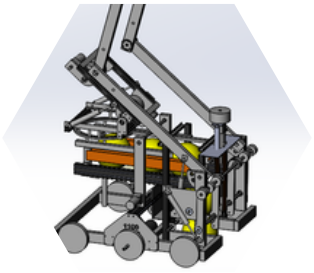
2. DESIGN MEETING

- Team leaders and mentors meet to discuss ideas heard at presentation
- Subsections meet to synthesize ideas into one design
- Everyone decides which ideas to prototype

3. PROTOTYPING

- Designs chosen in strategy meeting are prototyped by mechanical sub teams over build time

ROBOT DESIGN PROCESS

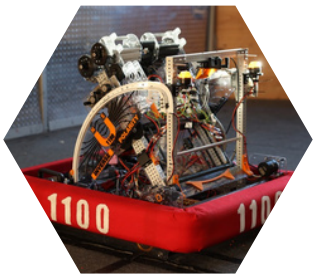


4. FINAL DECISIONS

- Designs are chosen from prototypes and developed further in CAD
- Prototypes for various subsystems begin development

5. MANUFACTURING

- Based on final decisions, designs are manufactured at our school, teaching students how to take designs from paper (or screen) to the machine shop
- Electronics are wired with care, software is developed in parallel



6. TESTING AND REVIEW

- Software is loaded into the fully integrated system and debugged on field elements built at our shop

TEAM 1100 ALUMNI

Class of ‘26

6/6 graduating seniors are pursuing a degree in STEM

Class of ‘25

3/3 graduating seniors are pursuing a degree in STEM

Class of ‘24

4/4 graduating seniors are pursuing a degree in STEM

IN OUR SCHOOL

ALGONQUIN REGIONAL HIGH

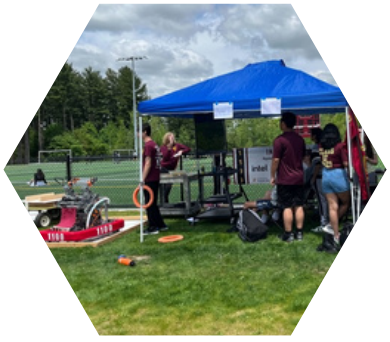
- **Football Games + Pep Rally**
  - Who we reach: ARHS Community (students, families, alumni), Opposing teams (Central MA teams in our division)
  - What we do: demo t-shirt cannon robot at the end of each quarter of football games (~10 Friday night home games in the fall) and the pre-Thanksgiving game school-wide pep rally
  - Results: School spirit in a different light, connecting robotics to sports in an exciting way for students who may not see STEM as something outside the classroom

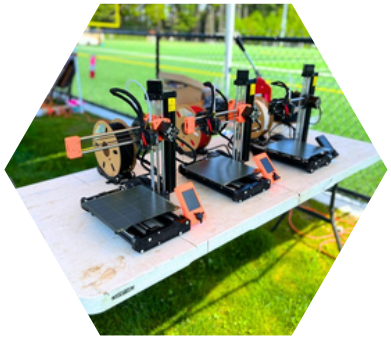
- **Unified Basketball Games**
  - Who we reach: Unified Basketball Team + Game Attendees
  - What we do: demo our 2024 FRC robot by driving around and launching rolled up t-shirts out of the shooter
  - Results: Expanding our demo during football games and the pep rally while supporting our neurodivergent teammates on the Unified Basketball team, with the while introducing FIRST and robotics to the game attendees

ALGONQUIN REGIONAL HIGH

- **Fall Club Fair**
  - Who we reach: ARHS Students
  - What we do: Demo our FRC and FTC robots, sharing the details of our team and program at our school for new students (both freshmen and upperclassmen) to learn more about our team
  - Results: encourage students of all ages to join the team, highlighting the differences between our team and clubs/sports at Algonquin

- **Spring Carnival**
  - Who we reach: ARHS Students
  - What we do: host a booth with activities in the spring for students to unwind before the end of school. Mini games include 3D printing custom keychains, a demo of our robot from that year's FRC season, and a Mario Kart tournament!
  - Results: Through games, both video and robot-related, and creative outlets with 3D printing, we aim to introduce STEM to our peers who may have missed us in the fall club fair. This event emphasizes the importance of art and design in STEAM, all while having fun and celebrating the end of school.





IN OUR COMMUNITY

OUR COMMUNITY

- **Summer Nights in Southborough and Applefest in Northborough**
  - Who we reach: community members of all ages, future sponsors/mentors
  - What We do: demos and interactions with FRC bots, kids drive small robots, hand out souvenirs, answering questions, and engaging community
  - Results: engage kids in STEM, recruit mentors/sponsors, fundraise

- **Geek Is Glam**
  - Who we reach: Central MA Girl Scouts
  - What we do: provided a hands-on robot building experience with 1100 student during 2 workshop sessions while also demonstrating our robot at the event expo
  - Results: introducing Girl Scouts to Robotics through hands-on building experience

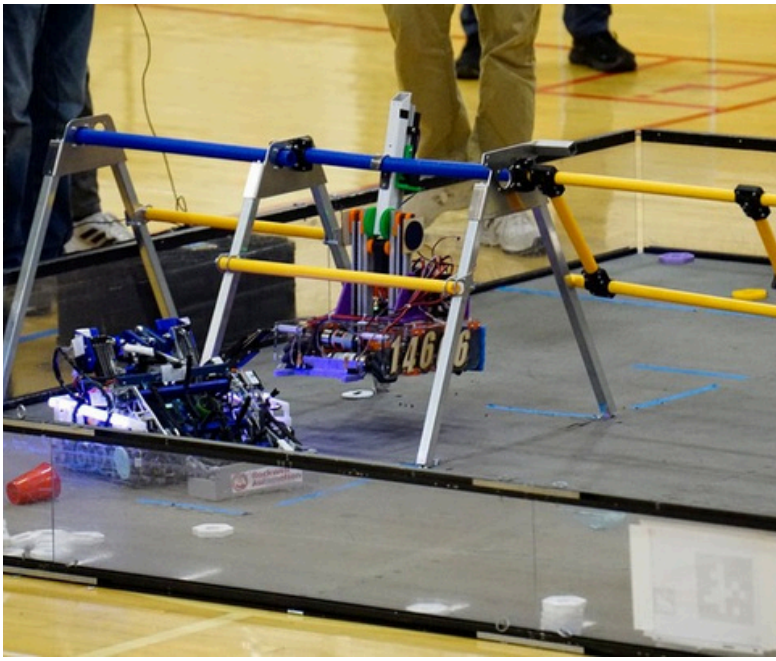
IN OUR COMMUNITY

- **Girl Scout Demos**
  - Who we reach: Girl Scouts
  - What we do: demo robots, give tours of our facility, help scouts build their own small robots
  - Results: Scouts see their own potential in STEM, get excited about robots, gain some technical experience

- **FLL Season in a Day**
  - Who we reach: Girl Scouts
  - What we do: Girls built and programmed an FLL robot in a single day
  - Results: cultivate an interest for women in STEM, introduce young members of the community to robotics through an intro to block coding and simulation of designing and building a robot




IN THE FIRST COMMUNITY

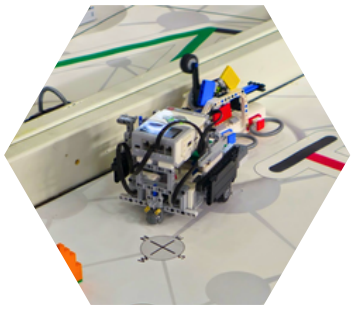


FIRST LEGO LEAGUE

Teams

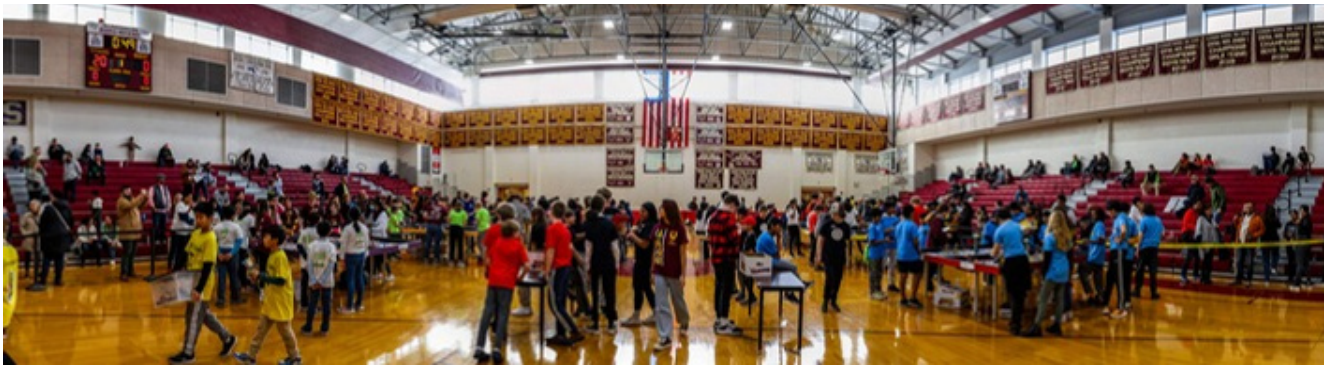
FRC 1100 started FLL Team 26129 in 2016, continuously mentoring them since. In 2024, we started 53711 for grades 4-8, helping them register and providing materials like a practice field and Legos to build with. Between starting and mentoring teams, we reach over 20 students in the area. During our demos at Applefest and Summer Nights, we provide parents with information about FLL and encourage them to start their own teams, extending FIRST's reach in our community.






Events

Team 1100 hosts two FLL annual events: Team 1100 Test Drive, a preseason scrimmage since 2011, and the Northboro Qualifier since 2019. In 2024, we increased capacity to 64 and in 2025 with 50 teams to accommodate a higher number of teams in the area. We volunteer in various roles at FIRST events such as the WPI FLL Qualifier, Robonautica State Championship, WAFFLE @ WPI and Massachusetts State Championship



FIRST TECH CHALLENGE

In 2018, we started FTC 14666 as a way for our new students to acclimate to FIRST prior to the start of FRC season in January. Since then, we've seen several student build their excitement and knowledge in FTC, carrying these skills into FRC and becoming student leaders. In 2025-2026, we have since altered our FTC team structure to serve freshmen and local eighth graders who are ready to graduate from FLL. .

This year our FTC team was comprised of solely unexperienced members and our FRC students stayed involved, but this time, in the roles of student mentors. 4 high school mentors guided them through the transition from FLL to FTC to FRC in the fall.

Most students came in with very few technical skills for machining and design, but were able to build on their FLL experience learning how to use OnShape to CAD the robot, prototyping and iterating in the machine shop and programming a FTC robot.

Our FRC driver became FTC drive coach, guiding students through their qualifiers in December and January. We look forward to our new members joining 1100 in the FRC build season and expanding the FTC program further to include more students, with the ultimate goal of retention in a FIRST program.

FIRST ROBOTICS COMPETITION

By publishing various resources on team1100.org, we provide tools for hosting a fundraiser such as our Build-Your-Own-Robot workshop (included in the FRC Fundraising Toolkit on the FIRST Inspires website) and “Guide to Technical Demos” which helps teams make an impact in their communities.

Coupled with our FRC kickoff workshops and award submissions, we have published a foundation of knowledge for teams to build upon, no matter their location in the world. For instance, we knew that many teams would need assistance acclimating to the new AprilTag vision system. So, in 2023 we published an in-depth guide on GitHub that explains how to set up an AprilTag vision system. It provides the resources and instructions necessary for everyone, even non-programmers, to starting detecting and tracking AprilTags. On our YouTube Channel, we have posted several recordings of Workshop Wednesdays 2025 - an team initiative to help newer members learn from student leaders, alumni and mentors to grow their expertise and skills prior to build season.

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