Littleton Robotics:

FLL Challenge Teams

Program Overview 2023: Fall Session

Last Updated on May 8, 2023

This packet goes over the Littleton Robotics FLL Challenge Program for the 2023 season. It contains information for both first-time and returning members.

Please read through the entire document carefully! The entire structure of the Littleton FLL program has changed for 2023 so families need to be fully aware of the updated operational parameters and expectations.

What is FLL?

FLL stands for "*FIRST* Lego League." *FIRST*, or "For Inspiration and Recognition of Science and Technology", is a non-profit organization with competitive robotics programs for students K-12 worldwide. FLL Challenge is the program for students in grades 4-8. In FLL Challenge, students are tasked with creating a fully autonomous LEGO robot to play a themed game, completing an in-depth research project on the game theme, as well as learning and applying teamwork skills along the way through the *FIRST* Core Values.

What are the *FIRST* Core Values?

The *FIRST* Core Values are listed below. All *FIRST* participants are expected to learn and apply these Core Values in and outside of robotics meetings.

- **Discovery:** *We explore new skills and ideas.*
- **Innovation:** *We use creativity and persistence to solve problems.*
- **Impact:** *We apply what we learn to improve our world.*
- **Inclusion:** *We respect each other and embrace our differences.*
- **Teamwork:** *We are stronger when we work together.*
- **Fun:** *We enjoy and celebrate what we do!*

Overview

Littleton FLL is a community organization, hosted by Littleton Robotics, a registered 501(c)(3) organization. We partner with FRC Team 6328 Mechanical Advantage and their other FLL Challenge teams run through Bolton Robotics for scrimmages and outreach events throughout the year. Littleton FLL started running FLL programs in the summer of 2017.

We encourage our FLL 8th graders to pursue FRC in high school, through 6328 or one of the other local FRC teams depending on what works best for your family. One of our major goals is to get students excited about STEM and robotics at a young age and keep them engaged as they move through the *FIRST* programs, so they carry that enthusiasm to high school. Our mission is to develop the STEM leaders of the next generation, and we are doing that now!

Every year we have at least one parent who wants their student to be in robotics more than the student wants to be there, and usually that is the kid who is uninterested, doesn't focus, and distracts their teammates and coaches. If that is your student, please don't sign them up for robotics. Their lack of interest will shine though in one way or another and we may ask them to leave the team to give someone else the opportunity. We always have more interested students that we have space for, so please be considerate of another student who may relish the opportunity.

The Littleton FLL program is administered by the Program Directors Katie Bonner (primary) and Michelle Tuck (backup).

THE PRIMARY GOAL OF ALL TEAMS IS ***HAVING FUN WHILE LEARNING!*** Awards and ranking are NEVER the focus of our program.

FLL Challenge Teams for Fall Competitions

Each team will have 4-6 student members with a minimum of 1 project coach and 1 robot coach, and a high school student mentor if available. All adult coaches and student mentors will be registered with *FIRST* and complete the *FIRST* Youth Protection Program training (a short self-paced online program).

The team assignments will be decided on by the Program Directors, with input from coaches and student mentors. Once the fall teams are posted each season, the decision is final. If the Program Directors determine that a change to the teams needs to be made, including removing a member from the team, they may do so. If a concern comes up regarding your child's team placement after the team assignments are made, please email the Program Directors to set up a meeting to discuss.

Littleton FLL can run up to five teams, though we may run fewer in a season depending on volunteer coach availability. Our 5 Teams are identified in the *FIRST* system as follows:

1. 30554 - Powerful Pulleys
2. 32514 - Littleton Levers
3. 32648 - Mechanism Madness
4. 45129 - Wild Wedges
5. 45554 - Groovy Gears

The number of teams we can run will depend on how many volunteers we have to be Robot and Project Coaches (see more details further in this document). Without volunteer coaches (at least 2 per team and preferably 3-4), we cannot run FLL teams. If you volunteer as a coach, your student is guaranteed a place on the team. How many spots are available for other students will depend on the number of coaches/teams we have. We do expect to have more interest than available spots for students.

Fall Program Overview

The fall FLL competition game is scheduled to be released on August 1. The competition consists of 3 parts: robot, project, and core values. Each part is **equally important** and team participants are expected to give equal time to each section.

At events, students participate in official robot matches and a 30-minute presentation/Q&A with a panel of judges that covers robot design, the research project, and demonstration of core values. During meetings, teams will have ample opportunity to prepare for and practice their presentations.

Robot

- Students are tasked with building fully autonomous robots to complete various missions
- Each game has 15-18 missions available to choose from laid out on a 4'x8' table, most teams complete 6-10 missions
- Students pick which missions to complete in a 2.5-minute match (can combine multiple missions in one "run")
- Students can only touch the robot (to switch mechanisms, start a new run, etc.) in the "home base" area; if students touch robot outside of base a penalty is assessed
- Robot utilize motors, sensors and mechanisms the students design to navigate the field and complete missions (can change mechanisms in the home base so there is a strategic advantage to easily attached and detached mechanisms)

Project

- Students are tasked with completing a community service or research project that is related to the game theme. The project parameters are very broadly defined.
- The three steps of the project are identifying a problem, completing background research on the problem and existing solutions, and proposing a solution/improvement to the problem. Students are encouraged to design prototypes/models of their solutions, as well as creating documentation that explains their process and share their work widely with the community.
- At competitions, students will display their project work on a poster board in their pit area.

Core Values

- Students are expected to learn and practice using *FIRST* Core Values during meetings and outside of FLL. These principles are at the core of *FIRST* and help everyone become productive and respectful members of their communities!
- We will have periodic core values (team building essentially) challenges throughout the season so the students can develop their teamwork skills.
- Students, mentors, coaches, parents and anyone else affiliated with the team will be monitored all day during meetings and events to ensure everyone is following the *FIRST* Core Values.

Judging sessions

- Coaches and parents are not permitted to attend judging sessions. Teams will have plenty of opportunities to practice their presentations before attending a competition.

Parent Volunteer Options Defined

Our program is 100% volunteer, run by adult and student volunteers who believe in the benefits of the *FIRST* programs. We require all families to volunteer for a minimum of 1 role during the FLL season. **Every family volunteers**, whether it's coaching, admin tasks, getting sponsors, scheduling interviews with experts, etc.

The most critical roles are the Robot and Project Coaches. Without parent/family volunteer coaches (at least 2 per team, and preferably 3-4), we cannot run FLL teams. **If you volunteer as a robot or project coach, your student is guaranteed a place on your team.** How many spots are available for other students will depend on the number of coaches/teams we have. We do expect to have more interest than available spots for students. No experience required for volunteer coaches as long as you're willing to learn along with the students and support their journey.

We also have high school student mentors who enjoy supporting our FLL Challenge teams and working with the younger students. How many are available each season depends on their academic and extracurricular schedules. They are a great resource and a wealth of knowledge about FLL problem solving (most are actually FLL alumni), but the adult coaches ultimately have the responsibility of ensuring their team is accomplishing their tasks and working towards their goals.

Parent Volunteer roles and their descriptions:

1. **Robot Coach (1-2 per team):**
    a. Robot coach: Attend all meetings and events/competitions, help teach a small group of students basic programming, robot and attachment building, game strategy and problem solving. Provide general guidelines and help keep students focused and on task.
        i. A robot coach should ideally have some general programming knowledge (any programming language) and be able to learn basic Python. If you do not already have programming knowledge, you can pick it up but you'll need to work a bit harder to stay a few steps ahead of the kids.
        ii. The robot coach encourages the students to do the work and may not do any of the building/programming themselves. They should ask questions and help with ideas when students get stuck.
        iii. Help students remember the goal of having fun while learning and showing their Core Values
2. **Project Coach (1-2 per team):**
    a. Attend all meetings and events/competitions to work on the research project, including brainstorming, choosing a project, researching, meeting with experts, preparing a presentation/prototype (if appropriate)/tri-fold board, and sharing with the community. Provide general guidelines and help keep students focused and on task.

i. A project coach must have patience and a general willingness to encourage the kids to learn, research and present. A project coach encourages the kids to do the work, they do not do the research for them.
ii. A project coach must attend all the competitions where their project will be presented.
iii. Help students remember the goal of having fun while learning and showing their Core Values

3. **Team Administrator (1 total):**
    a. Collect team agreement, maintain contact/demographic information, track student attendance, coordinate competition dates and carpools, etc.
4. **T-Shirt Coordinator (1 total):**
    a. Coordinate the t-shirt order (design will be provided) along with the sponsor logos, shirt sizes, and any extra short/sweatshirt orders and payment
5. **Snack/Supplies:**
    a. **Snack/Supplies Coordinator (need 1):** Coordinate a team of parents who provide snacks every week. Check on general facility supplies (paper towels, hand sanitizer, tissues, toilet paper, etc.) and solicit donations when replenishments are needed.
    b. **Snack Parent (need 3-4):** Purchase and bring snacks regularly for the kids on a rotating schedule. Make sure snacks are available for a mid-meeting break to help students focus the rest of the time.
6. **Sponsorship Volunteers (unlimited):**
    a. Solicit 1-2 $250+ sponsorships for the back of the t-shirt (must be completed by early October to allow time for shirts to be printed).
    b. The more sponsorships we have, the more funds there are to purchase additional robots, sensors, laptops, etc. for team use.
    c. Parent/family employers are often great places to go to for sponsorship requests.
7. **Team Accountant** (position currently filled)

Fall Meeting Schedule

Regular fall meetings will begin after Labor Day at Littleton Robotics HQ (20 Harvard Road Building D, a stand-alone building on the campus of Patriot Beverages in Littleton). If everyone's schedule permits, we may also hold August meetings to get an early start. Potential August meetings will be decided on once we know who this year's coaches will be and what their schedule is. Participation in any August meetings is strongly encouraged and participation at all of the meetings once school starts is required.

1. Regular meetings will be held on Wednesdays at Littleton Robotics' shop.
2. The shop will be open 6-9pm. Each team may set their own schedule within that time, but we recommend meeting for at least 2 hours.
    a. **Students are required to be at all the meetings (unless they are sick, have a doctor's appointment, etc.), they are not permitted to chronically arrive late or leave early. Doing so is a disservice to their teammates.**
3. Teams may arrange on their own to occasionally get together outside of the Wednesday shop time in person or via online meeting platforms if proper adult supervision is provided.
    a. However, supplies provided by Littleton Robotics (laptops, robots, LEGOs, mission models, etc.) must stay at the shop.

    b. Additional meeting times may be best used for working on the research project or meeting with field experts.
4. There will likely be extra meetings available before practice events and competitions, as needed. Schedules for extra meetings will be determined at a later date.
5. Attendance at practice events/scrimmages and competitions is required.

Fall Program Overview – Main Events

Below is a summary of all main events for the fall season. Events include demos, fundraisers, scrimmages/practice events and official competitions.

1. **Outreach Events: Students and coaches are encouraged to participate in outreach events:** Backyard Bolton is an outreach demo event at the Bolton Town Common, usually in September. We may work with the Bolton Robotics FLL teams to set up a game table and the students will demo a previous robot. We will post other outreach opportunities when they occur. This is an optional fun event.
2. **Scrimmages** through the fall
    a. **Bolton Robotics Scrimmage – Saturday in Late October:** Littleton Robotics is sometimes invited to a scrimmage with the FLL teams of Bolton Robotics and other nearby teams at the Florence Sawyer School cafeteria.
    b. **Northborough Test Drive Scrimmage – Early November:** This scrimmage event is usually the first Saturday in November and takes place at Algonquin High School in Northborough 9:00 am – 2:00 pm. This event is an opportunity for students to have a practice competition with their robots. There are no practice judging sessions.
    c. **FRC Team 6328 Scrimmage:** This scrimmage event is usually in mid-November on a weekend day. It mimics a real competition with robot matches along with practice judging sessions. This event starts first thing in the morning and ends in the mid-afternoon. **Participation in this event is required.**
3. **Qualifier Event – early December:** Each team will attend 1 qualifier competition which consists of robot matches and a judging session covering robot, project and core values presentations. These events are local, usually within a 30-minute drive. The Littleton Robotics FLL teams may or may not be attending the same Qualifier Event, that will depend on which one each team chooses to attend. Registration for these events usually opens in mid-October. All teammates are required to participate in their Qualifier event. *It is important to emphasize that we will not be able to confirm this qualifier date until mid-October.* This is a day-long event on a weekend and **participation is required.**
    a. Qualifier Events are usually the weekend before Thanksgiving and the first two weekends in December. Teams submit an ordered list of which event(s) they could attend and are assigned to the best fit.
    b. There are 2 main parts of the qualifier event – robot matches and a 30-minute judging session that covers robot design, project presentation, and core values evaluation. A variety of awards are presented at each event and about 20-25% of the teams at each qualifier event will advance to the state championship (“Robonautica”) at WPI held mid-December. Brief description is below.
    c. There will also be incognito Core Values judges walking around during the day to see how the teams are interacting. These judges will be looking at the students, coaches, mentors and parents. If any of these people are not abiding by the FLL Core Values, the

team can be disqualified from advancing to States or winning awards. It is important that everyone associated with the team demonstrates their FLL Core Values!

   d. The teams who will be advancing to Robonautica are announced at the end of the qualifier event. Meetings will continue after qualifiers for teams who advance to Robonautica. Teams who do not advance do not continue meeting.

4. **Robonautica - State Championship:** The State Championship occurs on a Saturday in mid-December and takes place at WPI's Harrington Auditorium. Approximately 64 teams will be at this event. The structure is the same as the qualifier – robot matches and a 30 minute presentation with judges. **All teammates are required to participate for the entire day**, but only teams who advance beyond their Qualifier will attend, although others are welcome to come and cheer.

Event participation: If your child cannot participate in the required events, then your child should not sign up to be in robotics.

Activity Fees

There is a $200 activity fee per student for the fall Littleton FLL Challenge program. Checks should be made out to "Littleton Robotics" and sent to Littleton Robotics, PO Box 291, Littleton MA 01460 or brought to one of the first FLL meetings in the fall. Venmo is also available to @LittletonRobotics (4-digit code is 3598 if needed) - please include your student's name and "Littleton FLL" in the notes line.

Please do not pay the activity fee until you know if your student has a spot on a team. It will likely take us much of the summer to figure out coaches and how many students we have space for.

The activity fee is non-refundable. If the registration fee poses a financial difficulty for your family, please reach out to Katie Bonner (katie.bonner@littletonrobotics.org). Scholarships and financial support are available, we never want the registration fee to keep a student from participating in the program.

The activity fee covers:

- team registration with *FIRST*
- FLL Challenge season materials (mat, mission models, game instructions, etc.)
- LEGO robots (Spike Primes and/or EV3s), at least two per team
- LEGOs, sensors, and other robot building supplies
- laptops, at least one per team
- one team t-shirt for each student and coach
- use of the Littleton Robotics building for meetings
- event registration fees - practice events and official competitions
- budget for research project/prototype supplies

Team Communication

We will be utilizing group emails and Slack for all team communications. **All coaches and at least 1 parent per student are required to join the Littleton FLL Slack channel.** This is a great resource to share ideas, have conversations, and work together to coordinate activities, etc. Once your student is officially registered for the fall FLL team, please watch for an email invite to the Slack workspace. We will also

utilize a Google Group email list for general all-team announcements. Parents are expected to check the Slack group and email regularly for team updates throughout the season. If a student email is provided, they will be included in the Google Group, and can be included in the Slack channels if desired.

FLL to FRC Transition Program

Every season we invite 8th grade FLL Challenge members to participate in our FLL to FRC Transition program to encourage continued participation in the *FIRST* programs as they transition from middle to high school. We work with FRC 6328 Mechanical Advantage, a Littleton Robotics team, to run this transition program. 8th grade students can attend offseason events and training programs with the high school team and participate in the Jan-Apr 2024 FRC season.

Students who will be in 8th grade in Fall 2023 are also welcome to join FRC 6328 directly. The FRC 6328 student application form is on the team's home page.

Email Katie Bonner at katie.bonner@littletonrobotics.org to sign up.

Questions?

If you have any questions on this information packet, please do not hesitate to reach out to Katie Bonner at katie.bonner@littletonrobotics.org