



CHOATE
ROSEMARY HALL

2020
2021

FIRST LEGO LEAGUE STARTER GUIDE

www.choate.edu

FRC Team 7407 – Wired Boars

Published Fall 2021

FLL Discover, FLL Explore & FLL Challenge

GUIDE OVERVIEW

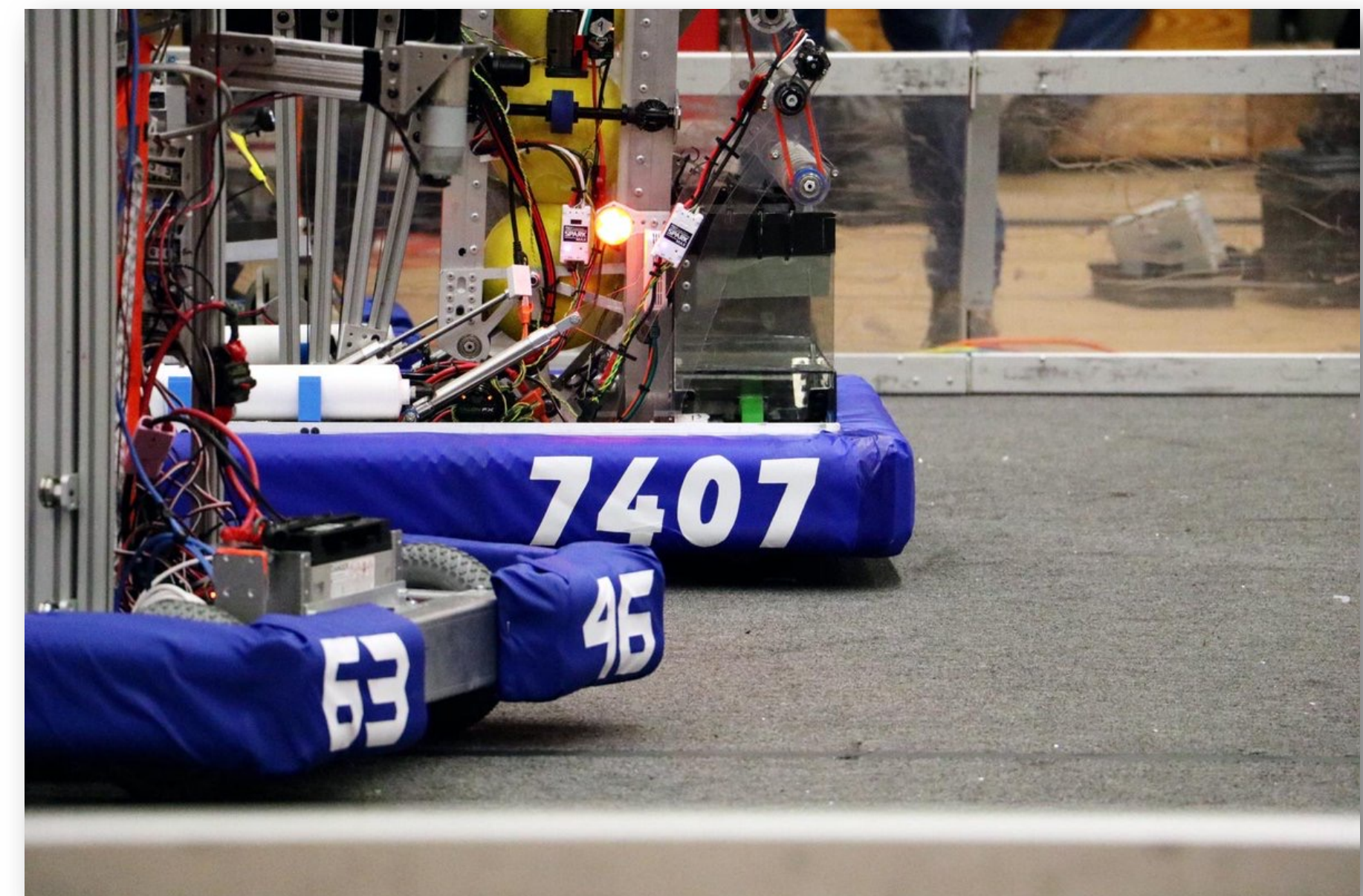
What is FIRST?

FIRST[®] is an acronym that stands for, “For Inspiration and Recognition of Science and Technology, and is a worldwide robotics program offering levels from pre-school all the way to high school. *FIRST*[®] is about more than robots, aiming to transform culture and inspire students to become STEM leaders.

FIRST[®] inspires 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, that inspire innovation, and that foster well-rounded life capabilities including self-confidence, communication, and leadership.



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FIRST LEGO League at a Glance

FIRST[®] *LEGO*[®] League guides youth through STEM learning and exploration at an early age. From Discover, to Explore, and then to Challenge, students will understand the basics of STEM and apply their skills in an exciting competition while building habits of learning, confidence, and teamwork skills along the way.



FLL Discover

This playful introductory STEM program ignites young students' natural curiosity and builds their habits of learning with hands-on activities in the classroom and at home using LEGO® DUPLO® bricks.



DISCOVER

2021 Challenge Information

In Cargo Connect, students will be exploring the world of package transportation around the world! Students will think of different ways to transport packages, learn about how packages are currently transported worldwide and create a LEGO model of their team model of how packages are transported to their destinations.

FLL Discover by the Numbers

Item	Cost
Annual Registration Fee	\$175
Steam Park Set & LEGO Duplo Kit	\$171
Engineering Notebooks	\$30
Shipping Costs	\$51
Total	\$427
Activity Fee Per 8 Students	\$53.38

FLL Discover Details

The cost breakdown shown here is for a class pack of 8 students and includes most LEGOS you will need for the season. However, it is typically advised to get additional LEGOS beyond the base kit to ensure all students on the team get equal building opportunities on the main model!



Visit *LEGO Education Shop* for additional *DUPLO sets* at *QR Code* →



FLL Explore

In Explore, teams of students ages 6-10 focus on the fundamentals of engineering as they explore real-world problems, learn to design, and code and create unique solutions made with LEGO bricks and powered by LEGO® Education SPIKE™ Essential or WeDo 2.0.



EXPLORE

2021 Challenge Information

In Cargo Connect, students will be exploring the world of package transportation around the world! Students will think of different ways to transport packages, learn about how packages are currently transported worldwide and create a LEGO model with moving mechanisms of their team model of how packages are transported to their destinations. Teams will also create a team poster showing their engineering journey and have the opportunity to present their model and poster at a local Expo!

FLL Explore by the Numbers

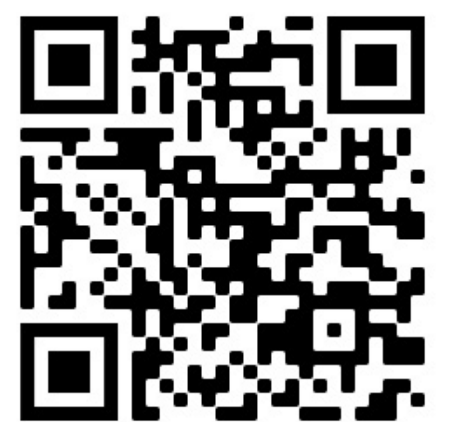
Item	Cost
Annual Registration Fee	\$99
LEGO Essential SPIKE Prime Kits	\$1060
Festival/Expo Registration	\$75
Shipping Costs	\$33
Total	\$1,267
Activity Fee Per 8 Students	\$158.38

FLL Explore Details

The cost breakdown shown here is for a team size of 8 with SPIKE Prime Essential Kit per 2 students. These kits will cover most of the LEGOS needed. However, it is typically advised to get additional LEGOS beyond the base kit to ensure all students on the team get equal building opportunities on the main model!



Visit LEGO Education Shop for additional SPIKE Prime sets at QR Code →



FLL Challenge



Friendly competition is at the heart of Challenge, as teams of students ages 9-14 engage in research, problem-solving, coding, and engineering - building and programming a LEGO robot that navigates the missions of a robot game.

2021 Challenge Information

In Cargo Connect, students will be exploring the world of package transportation around the world! FLL Challenge consists of **4 main parts: robot design, robot game, project and core values.**

Robot Design

- ✓ Identify your mission strategy
- ✓ Design your robot and programs using your work plan
- ✓ Create your robot and coding solution to match your mission strategy
- ✓ Iterate and test your robot and programs
- ✓ Communicate your Robot Design process, your programs and your robot solution

Robot Game

- ✓ Build the mission models and follow the field setup to put the models on the mat
- ✓ Review the missions and rules
- ✓ Design and build a robot
- ✓ Explore building and coding skills while practicing with your robot on the mat
- ✓ Compete at an event!
- ✓ Teams utilize the LEGO EV3 kits or the LEGO Spike Prime sets to build their robots.

FLL Challenge



Innovation Project

- ✓ Identify and research a problem to solve, design a solution to the problem that helps others or your community
- ✓ Create a model or prototype of your solution
- ✓ Share your ideas, collect feedback, and iterate on your solution
- ✓ Communicate your solution at an event

Core Values

- ✓ Apply teamwork and discovery to explore the challenge
- ✓ Innovate with new ideas about your robot and project
- ✓ Show how your team and your solutions will have an impact and be inclusive
- ✓ Celebrate by having fun in everything you do!



FLL Challenge by the Numbers

Item	Cost
Annual Registration Fee	\$225
Challenge Mat & Mission Models	\$75
LEGO Education SPIKE Prime Kits	\$860 (1 kit per 5 students)
Event Registrations (Scrimmage, Qualifier & States)	\$225
Extra Robot Supplies	\$200
Project Supplies	\$100
Core Values Supplies	\$100
Team Shirts	\$150
Shipping Costs	\$47
Total	\$1,982
Activity Fee Per 10 Students	\$198.20

FLL Challenge Details

The cost breakdown shown here is for a new team with 10 students. It is recommended to get at least 1 SPIKE Prime kit per 5 students, but it also wise to budget for miscellaneous robot parts that may need to be ordered later in the season. You can get individual LEGO Technic pieces from eBay if you need something specific and not a whole set!



Visit *LEGO Education Shop* for additional *SPIKE Prime* sets at QR Code →



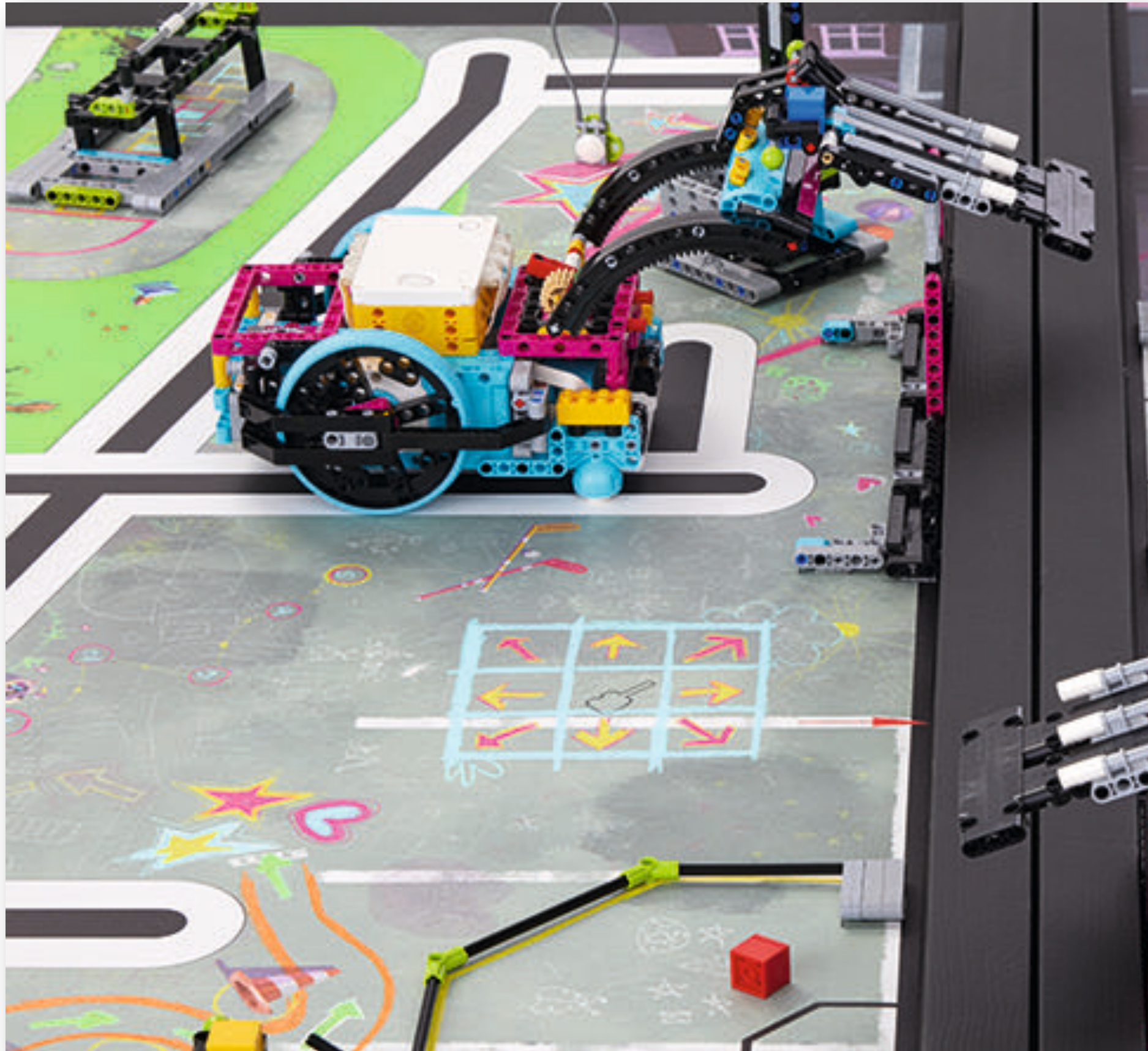
Coaches & Mentors

FIRST LEGO League depends on great coaches and mentors to run teams and inspire our students. The great thing about FLL is that you do not need any experience or a technical professional to be a coach or mentor! FLL provides meeting guides for all FLL levels, guiding new coaches and mentors through the season step-by-step. It includes pacing of activities and goals for where your team should be at all points in the season.

Anyone can be a mentor, including students on other FIRST teams, such as FRC (FIRST Robotics Competition) and FTC (FIRST Tech Challenge). Coaches must be 18 years or older and register on the FIRST Dashboard.



Fundraising



TEAM FUNDRAISERS

Teams can hold different fundraisers year-round to raise funds for the season. Common fundraisers for FLL teams include bake sales, car washes, partnering with local restaurants as well as raffles.

GRANTS

There are grants available for FLL teams on the FIRST website. More information about available FLL grants can be found here: <https://www.firstinspires.org/robotics/team-grants>

SPONSORS

Teams can also obtain sponsorships from large companies, families, friends and local businesses. FLL sponsorships usually range from \$100-\$500. It can be helpful to have parents make a list of company contacts they have, and then have students write emails to contacts explaining what they are doing, why it is important and what the team's funding needs are.

ACTIVITY FEES

Many teams charge activity fees to participate on the team. If the team is running through a school, there may be rules in place that prevents or caps activity fees for school clubs. Typical FLL activity fees range from \$50-\$300 for the season, and depends on the team's other funding sources.

Additional Resources



2021-2022 SEASON INFO FOR ALL LEVELS

<https://www.firstlegoleague.org/season>



FIND AN EXISTING TEAM NEAR YOU

[HTTPS://WWW.FIRSTLEGOLEAGUE.ORG/FIND-FIRST](https://www.firstlegoleague.org/find-first)



FIRST LEGO LEAGUE HOMEPAGE

<https://www.firstlegoleague.org/>



FIRST FUNDRAISING TOOLKIT

<https://www.firstinspires.org/resource-library/fundraising-toolkit>



LEGO EDUCATION SPIKE LESSON PLANS & TUTORIALS

<https://education.lego.com/en-us/lessons/prime-competition-ready>

