# FIRST LEGO League Explore

(2nd–4th grade)



**Team size**: 2-6 kids

**Coach**: Needs to be well organized and able to get kids to work together. No knowledge of motors/gears needed.

**Minimum cost**: Team registration is $99, buy/borrow a $300 LEGO WeDo 2.0 set, and add $40 for misc. materials for the presentation board. Optional items would include team T-shirts (~$100), additional LEGO pieces ($ at your discretion), parts organizer bin/totes ($30). GSEOK has 1-2 WeDo sets available to borrow

**Time Commitment**: 8-12 weeks in the fall. 60-90 minutes for weekly meetings will be adequate, coaches should add 30+ minutes/week prep time. Challenge is released in August, Exposition of projects is in November. State Championship Exposition is in December.

**Official Description**: 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 WeDo 2.0.

**Suzanne's Unofficial Description**: Non-competitive "exhibitions" mean that every kid feels like a winner. The judges give written and verbal comments (3 or more positives for every constructive criticism). Teams research the challenge, share results with their teammates, and choose a model to build. The final model must include at least 1 motorized component, be comprised solely of LEGOs, and no larger than 30" x 15" (the size of 2 large baseplates).

The kids really learn teamwork, they start realizing all the engineering problems that have been solved around them ("Hey look, mom, the creek runs thru the park. That's why they built a park here instead of houses – the park might flood!"). They can invent new solutions to the challenge, or choose to just build a model of something that exists. The competition is a FUN atmosphere – kids that stay into the afternoon are treated to a dance party while the judges tabulate the big kid's results.

## What is FLL Explore? (Video)?
https://www.youtube.com/watch?v=afYrsiQ48wA

# FIRST LEGO League Challenge

(4th-8th grade)

**Team size**: 2-10 kids

**Coach**: Needs to be well organized and able to get kids to work together. No knowledge
of motors/gears needed if a coach is willing to learn by watching YouTube videos.
A tech-savvy kid can make the coaches job easier, but a rookie team will do fine with a
willingness to learn.

**Minimum cost**: $225 registration, $75 field kit each year. Will also need to buy/borrow a LEGO
MINDSTORMS kit ($500, GSEOK has several to loan). Optional items would include team T-shirts (~$100),
parts organizer bin/totes ($30-$80). Use of a laptop computer is required, can be provided by coach or owned
by the team.

**Time Commitment**: 10-12+ weeks in the fall.  2 hours/week will be adequate, plan on a few last-minute Friday
night sessions if your girls tend to procrastinate. You don't need every single girl at every meeting, especially if
you have a large team. Challenge released in August, Tulsa Qualifier is in Nov. State Championship is in Dec.

**Official Description**: Introduces younger students to real-world engineering challenges by building LEGO-
based robots to complete tasks on a thematic playing surface. FLL teams, guided by their imaginations and
adult coaches, discover exciting career possibilities and, through the process, learn to make positive
contributions to society. Elementary and middle-school students get to:



- Design, build, test, and program robots using LEGO MINDSTORMS® technology
- Apply real-world math and science concepts
- Research challenges facing today's scientists
- Learn critical thinking, team-building, and presentation skills
- Participate in tournaments and celebrations

**Suzanne's Unofficial Description**: The robot game is only 1/3rd of the competition. The other components are
the core values (teamwork demonstration) & a creative new idea/prototype that deals with the challenge.
While this division is competitive (1st, 2nd, and 3rd place), there are winners for each portion of the competition.
The overall winner is VERY RARELY the team with the best robot.

**Robot Game:** The team builds and programs an autonomous robot using LEGO Mindstorms. At the beginning
of the season, they're given a 4' x 8' mat that represents the game arena. On the mat are different areas where
the robot can accomplish different tasks – "see" the red ball, pick it up, and put it thru the hoop. Or pick up and
move an "ambulance" into the disaster zone. Each task is assigned a point value. It's physically impossible for
a robot to accomplish all tasks in the time allotted, so the team prioritizes what the robot will do to earn the
most points.

**Project:** The project component of the competition involved identifying a real-world problem relating to that
year's challenge, and coming up with an innovative solution. The team then has to present that solution
through a presentation (and poster), and is judged based on the ingenuity of the idea and how well it is
presented to the judges.

**Core Values:** FLL publishes a list of core values (not unlike the GS law). Teams are scored on how well they
exhibit those values by working together to solve a problem in front of judges (the problem is different for each
qualifier).

# FIRST Tech Challenge

(grades 7-12)

**Team size**:  2-15 kids (5-10 kids is ideal)

**Coach**:  2-3 mentors per team is recommended. Ideally, one of those should have some knowledge of engineering or mechanics. However, there is a group called NEMO (Non-Engineer Mentor Organization) that supports mentors and coaches who aren't engineers themselves.

**Minimum cost**:  A well-funded team would run $2500-$5000 for materials if they plan to only compete locally, though a "bare-bones" robot could get by with $1500 if they also receive the $500 Rookie Grant. Add more funds if they travel to a regional/national competition. Use of a Laptop Computer is required.

**Time Commitment**:  WEEKLY meetings Sept-Jan, 2-4 hours per week for the coach, lots of flexibility in time commitment for the girls (much of the time they'll be working in small groups).  The 2 weeks before the competition the team will probably be meeting more frequently (not the whole team, just a few members). Challenge is released in September, with qualifiers in January and State Championship in February

**Official Description**: FTC is designed for students in grades 7-12 to compete head-to-head, using a sports model. Teams are responsible for designing, building, and programming their robots to compete in an alliance format against other teams. The robot kit is reusable from year to year and is programmed using a variety of languages. Teams, including coaches, mentors, and volunteers, are required to develop strategies and build robots based on sound engineering principles. Awards are given for the competition, as well as for community outreach, design, and other real-world accomplishments. Students get to:

- Design, build, and program robots
- Apply real-world math and science concepts
- Develop problem-solving, organizational, and team-building skills
- Compete and cooperate in alliances and tournaments
- Earn a place in the World Championship
- Qualify for over $12 million in college scholarships

**Suzanne's Unofficial Description**:  A big step up from FLL in terms of difficulty and time commitment, but even more fun. A rookie team should be paired with an experienced team that can show them the ropes. Teams will likely hold a combination of whole team meetings and "small group" sessions that work on the robot (High school kids have busy schedules, and building the robot will take 30+ hours). Teams can win awards for a well-thought-out design and great presentation for the judges, even if the robot isn't the best.

**Grant money**:  $500 "rookie grant" awarded to most teams that request it (1st-year cost is very high).  A very limited number of loaner kits may be available, and should be requested the spring before the fall season.
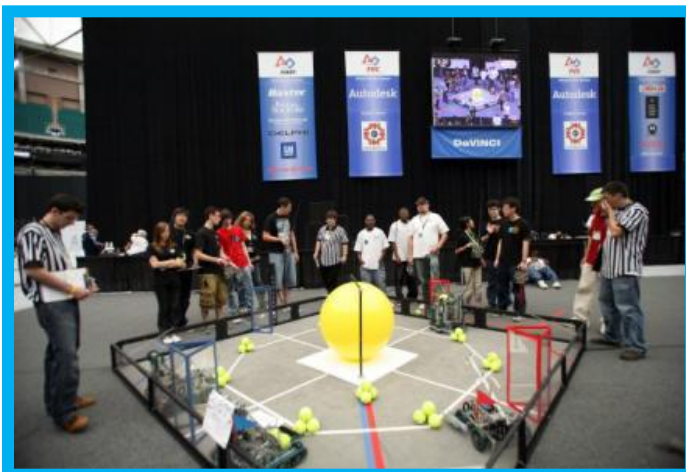
# FIRST Robotics Team Information

The Girl Scouts of the USA has formed a partnership with FIRST (For Inspiration and Recognition of Science and Technology) with the goals of encouraging more girls into STEM (Science, Technology, Engineering, and Math) careers and gender equity in our global society.

Girl Scouts of Eastern Oklahoma is proud to provide the opportunity for girls to participate in one of three levels of FIRST Robotics: FIRST LEGO League Explore, FIRST LEGO League Challenge, and FIRST Tech Challenge. Girls must register as Girl Scouts in Eastern Oklahoma. Space is limited and teams will be accepted on a first-come, first-served basis.

**Team Responsibility: GSEOK and FIRST**

*For each GSEOK FIRST Robotics Team, Girl Scouts of Eastern Oklahoma will:*

- Provide ongoing support and resources throughout the season
- Reimburse teams for their FIRST Team Registration fee and Challenge Set
- Provide a robot kit of parts, if needed
- As funding allows, reimburse teams for other participation expenses (tournament registrations, travel, t-shirts, etc.). This is not guaranteed and exact reimbursement amounts are not known until after the season has concluded.

*Each GSEOK FIRST Robotics Team will:*

- Register team with FIRST Inspires and pay the team fee
- Sign GSEOK Team Agreement
- Have a plan in place for adding new girls to the team. GSEOK teams must have 5 girls
- Provide laptop computer to program the robot
- Purchase supplies for and build a practice table
- Provide/find a practice location and a secure storage space for robotics kit and table
- Pay registration fees for additional tournaments (optional)
- Provide snacks and beverages for practices and tournaments (optional)
- Pay for add-on materials for robots
- Pay for team transportation costs
- Participate in evaluations when requested

More information about FIRST Robotics is available at https://www.firstinspires.org/robotics/fll**.**

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