FIRST Lego League Overview

-FIRST® LEGO® League (FLL®) 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.

Each year FIRST LEGO League releases a Challenge, which is based on a real-world scientific topic. Each Challenge has three parts: the Robot Game, the Project, and the Core Values. Teams of up to ten children, with at least one adult coach, participate in the Challenge by programming an autonomous robot to score points on a themed playing field (Robot Game), developing a solution to a problem they have identified (Project), all guided by the FIRST LEGO League Core Values. Teams may then attend an official tournament, hosted by FIRST LEGO League Partners.

In late August or early September, the FLL Challenge including the Research Project, Robot Game and Core Values is released online. Teams begin by designing, building and programming their robots and completing the research project during September, October and November. Teams register for tournaments in early October and, if available, attend practice tournaments in late October or early November and Qualifying Tournaments in November or early December. Tournaments are usually scheduled on Saturdays and Sundays. The top 20-30% of teams will advance to the Regional Championship Tournaments in mid-December.

2016 Season – Animal Allies

Get ready. Get set. Roar! Or you could bark, quack, or squeak, because the 2016 ANIMAL ALLIES season is all about our furry, feathered, and finned friends.

For ANIMAL ALLIES, think of people and animals as allies in the quest to make life better for everyone. Sometimes people help animals and sometimes animals help people. The Project mission this season is to make our interactions with animals better – hopefully better for all of us. In the past, people often thought about how animals could help us. Today, it’s time to think about how we can help each other. What might become possible when we work together with our ANIMAL ALLIES?

FLL Tournament Overview

Official tournaments must follow the judging and awards structure determined by FIRST LEGO League. Although the audience mostly sees teams playing the Robot Game at tournaments, teams are also being judged on: Core Values, Project and Robot Design. There are a set of FIRST “Global Standards,” but the Los Angeles Region may have modifications for official events.
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The Core Values Poster and the Robot Design Executive Summary are additional tools that may be used to help facilitate discussion in the Core Values and Robot Design Judging sessions.

Our 2016 Redondo Robo Rally practice tournament is not an official event, but it provides teams with a warm-up before they attend FLL tournaments in November. We will run the practice tournament much like a qualifying one to maintain the competitive atmosphere, but instead of FLL Awards, we will provide feedback to teams to help them learn from the experience.

Our tournament will be held at the Parras gym and classrooms. Judging of the robot design, project, and core values will be held in separate classrooms to allow teams 10 minutes to interact with the judges. Adult and student judges will listen to the teams and ask questions. Afterwards, they will assess the team based on the FLL rubrics and will write specific comments that will be returned to teams at the end of the day.

There is much published about the robot game – the rules and updates, the field setup, scoring of missions, and plenty of YouTube videos.

The robot performance rounds will be held in the gym. Teams will be paired up for four rounds of matches – one practice round and three scoring rounds. In official events, the best score determines a team’s ranking and eligibility to advance to championship tournaments.

Student referees will score teams for each match. Adult volunteers will provide oversight of the scoring for each table as backup. A student Head Referee will have final say on all calls and scoring inquiries. At the conclusion of each 2 ½ minute match, the referees will mark up a scoresheet to reflect scores and penalties. Each team will have a representative review the sheet and sign off to acknowledge the accuracy.

Team scores will be logged and a spreadsheet will track the ranking of teams based on their highest score achieved. The scores will be projected on the gym presentation screen for all teams to see (the judging scores are not made public).

A number of volunteers will help run the tournament – an emcee will keep the robot game moving, while queueurs will ensure that teams are lined up for the robot matches and judging sessions. The schedule depends on teams getting from one event to the next quickly – it can be hectic and confusing for both teams and volunteers!

Judging Overview

At official FLL events, teams are evaluated across all three judging sessions (Core Values, Robot Design and Project) for both awards and advancement to championship tournaments. Advancing teams must score in the top 40% of all teams participating in the Robot Game at the event.

It is possible for a team to receive a 1st Place Core Award but not advance to Championship if their Robot Performance score is below the top 40% of teams at the event. Or, a team may win 1st Place in Robot Performance but not advance to Championship due to not having performed well in one or more of the three judged areas.
Our primary objective is to provide teams with an environment that reduces the competitive anxiety and allows them to concentrate on presenting their ideas to gain confidence speaking to judges. A core value of FLL is to have fun, so keep that in mind. Also, treat their accomplishments and their work with respect. Feedback should target strengths and weaknesses in an encouraging manner.

With the Animal Allies Challenge FIRST LEGO League has ruled that live animals are NOT ALLOWED as part of a team presentation.

We plan to have three groups of judges for the tournament; one group per category. Each judging group consists of a Head Judge, second adult judge and 1-2 high school or university student judges. The groups will judge each FLL team once during the day. Due to the scheduling complexity, we need to arrange sessions throughout the day.

**Project Judging**

Teams present a challenge-related problem they have researched and analyzed. They also present their innovative solution to that problem, and tell about how and with whom they shared their research. These steps parallel the scientific research process in the “real world.” All of this information is communicated in a creative presentation to the judges that takes no more than 5 minutes, including setup time (10 minutes in our tournament).

Teams are requested to bring (4) copies of a Team Information Sheet. A copy should be given to the judges when the team enters the classroom. Keep this sheet with the rubric feedback to be handed back to teams at the end of the tournament.

As a Project judge, here are some overall things to consider:

To be eligible for any Project awards, teams must demonstrate that they have completed all three components of the Project: problem identification, development of an innovative solution, and sharing of the project with others.

Innovation and creativity are considerations in several of the Project rubric criteria. Try not to overly penalize a team for a solution they present as original, but that you know is already being considered or implemented. Different judges may also have very different knowledge levels of state-of-the-art science relative to the Project. If you are aware that their solution already exists, make it known to them in a respectful, gentle manner, and MAKE SURE you provide them that feedback.

**Project Sample Questions:**

**Research: Problem Identification**
- How did your team decide which problem to study?
- Describe the problem your team selected in three sentences or less.
- What are the most important things to understand about the problem that you studied?

**Research: Sources of Information**
- What resources did you use to research your problem and why did you choose these?
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- Did you use any unusual methods to research your topic? If so what and why?
- Did you speak to anyone whose work relates to the Challenge area? What did you learn from them?
- What was the most helpful resource that your team used? Why?
- If you had to start your research over, which resource would you use first? Why?

Research: Problem Analysis
- How did your team organize and use its research?
- After working on this project, what is the most important thing that your team learned?
- Can you tell us about a problem you discovered or something that you learned that surprised you while completing this project?

Research: Review Existing Solutions
- Are you aware of anyone else who has studied the problem you chose?
- How have other people tried to solve the problem you identified?
- Did the information you found offer different ideas than what you expected to find? If so, what and how did your team use this information?

Innovative Solution: Team Solution
- Describe the solution your team identified in three sentences or less.
- What are the most important things to understand about the solution that you developed?
- How did you arrive at your solution and why?
- Were there other solutions that you thought of that you decided not to use? Why?

Innovative Solution: Innovation
- What makes your solution different from what is being used to solve this problem now, and why do you think it is better?

Innovative Solution: Implementation
- If someone tried to use your solution today, would it be possible?
- What kinds of things would be important to think about if you tried to use your solution right now?
- What resources would you need to develop your solution?
- Do you think your solution would be easier or less costly than other solutions you considered or are used by others?

Presentation: Effectiveness
- How many/what different presentation styles did your team consider?
- Why did you choose the presentation style that you chose? How does this style help your audience understand what you are telling them?
- When you have given your presentation to others, what types of questions have they asked?
- Describe how you chose what information to include in your presentation.
- Why did you choose to organize your presentation the way you did?

Presentation: Creativity
- How did you decide on this presentation style that you used?
- What do you think was the most creative aspect of your presentation or project and why?
- How is the way your team chose to present your Project special or unique?
Presentation: Sharing

- One aspect of the project asked you to share your ideas with others. How did your team do this?
- With whom did you share your project? Why did you choose them?
- How did you share the information? Did you present it in the same manner as you presented to us, or did you choose a different approach? Why?
- What impact did your presentation have on them?
- What changes have you or others made as a result of your research and presentation?

Look for:

- Documentation of resources used.
- Depth of the information provided.
- All students participated in the research process, or understand the process and results of the team’s research.
- Supporting printed materials provided to judges.
- Entire team participating in discussion.
- How the team interacts with each other.
- Do they all talk, or only a few? If so, why?
- Does the team look to the coach often or are they focused on the presentation and judges.
- Noteworthy observations about FLL Core Values to share with the judging team

Robot Design Judging

Robot Design is a judged award based upon the rubric that addresses mechanical design and programming of each team’s robot. Technical judging begins with an interview with each team to discuss the design and programming of their robot.

Interviews take place in a separate judging area, which may include an FLL Challenge table with a field setup kit. This allows judges to observe a sample of robot action, and discuss robot design and programming challenges and choices with the FLL team. If teams bring a printout of their programming to the technical judging sessions, judges can review that as well.

As a judge, here are some overall things to consider:

The Robot Design judging session is more about the team's ability to present the robot and all the thoughts and considerations that went into their final product than it is about its performance. The performance is covered under the Robot Performance Award. The judging session is the time for the judges to learn from the teams the design processes they used to make decisions and gain understanding; it also allows discussion so that judges can be sure that the teams did the work.

**Robot Design Sample Questions:**

Mechanical Design: Durability

- How did you get your robot to stay together?
- How often does your robot fall apart? What happens and have you thought about ways to fix this?
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Mechanical Design: Mechanical Efficiency
• Would it be possible to use fewer pieces or components for your robot and still accomplish the same missions?
• If your robot has attachments, tell us about them.

Mechanical Design: Mechanization
• Tell us about how your robot uses attachments or other mechanisms to complete missions.
• Describe how your robot moves from place to place, or overcomes obstacles, and balances speed and power.

Programming: Quality
• What program do you feel is your best? Why?
• Do your robot’s programs achieve the same result every time? If not, why do you think this might happen?

Programming: Efficiency
• What did you do to make your programs more understandable and easier to use?
• What mission is your favorite? Explain the steps in the program for that mission.

Automation/Navigation
• Would you explain how your robot turns (or travels a specific distance, or goes from base to a specific destination)? How satisfied are you with this?
• As your robot moves around the field, was there one area that was more difficult to navigate than another? If so, what did your team do to overcome this challenge?
• Would you explain which sensors you used, and how and why you used them?
• Would you explain how your robot knows where it is on the field? Note: Sensing includes not only touch and rotation sensors, but time and passive sensing such as referencing to walls or other objects, etc.

Strategy: Design Process
• What was the greatest design or programming difficulty you encountered? How did you solve that problem?
• How did you test your designs?
• Describe one way your robot got better over the course of the season.

Strategy: Mission Strategy
• How did your team decide which missions to tackle?
• How many of the missions has this robot completed successfully in a single match (includes a tournament match, a tournament practice, or home practice)?
• We want to consider the overall strategy behind your robot’s design. Tell us about your robot, its attachments and sensors and the missions the robot attempts so that we will understand your team’s design strategy.
• Which attachments are most difficult to put on and/or take off? Innovation
• What part of your design, program or strategy do you think is unique to your team?
• How did you come up with the idea?
Look For:

- Unusual strategy, programming or design.
- Propulsion or steering methods or functional aspects that no one else has or you are surprised someone would try.
- Robot is able to effectively perform the same task over and over.
- Parts or functional aspects that make something difficult look very easy.
- Parts or mechanisms that perform several functions.
- Propulsion, steering methods or functional aspects that work, but children have no understanding how.
- Children can describe what the robot will do based on the program.
- Does the team look to the coach for answers or are they focused on the robot and judges?
- Noteworthy observations about FLL Core Values to share with the judging team.

Core Values Judging

Core Values may initially seem more difficult to judge than Robot Design or Project. There is a tendency by some to consider Core Values judging to be inherently more subjective than the other two areas because “data” for criteria such as Discovery, Inclusion and Coopetition are perceived to be difficult to obtain or use to differentiate teams.

As a judge, here are some overall things to consider:

There is tendency for teams that “practice” Core Values “speeches” to be looked upon unfavorably by some judges. The premise is that these teams are just acting to score well with the judges. However, teams should practice talking about Core Values just like they practice their Project presentations and Robot mission runs. The more they practice Teamwork activities and talk about Core Values, the more they internalize these abstract ideas.

Remember that you are evaluating how a team approaches Core Values throughout the season in addition to what they do at the tournament. The journey of the team and how much they learn and grow are important. Teams (including coaches, mentors, parents and others associated with the team) must uphold and display FLL Core Values at all times, not just during Core Values judging sessions.

Information about Core Values criteria can be obtained in several ways. Many Core Values judging sessions will include a Teamwork Activity and/or Core Values Poster to help judges observe and learn about specific behaviors, as well as focus and guide the discussion and interview time more effectively.

When Core Values judging includes a Teamwork Activity, a great deal of information can be learned from direct observation of the team working through the activity. It is important to remember that the purpose of the activity is to observe the team working on the problem, and not to focus on the result of their work.

When a Core Values Poster is required, it should be used as a tool to jumpstart a conversation between the team and the judges. It is designed to help teams focus their thoughts and examples in advance of the judging session so that they may be conveyed more easily and effectively to the judges.
In addition to the judging sessions, many Core Values judges like to observe the teams in their natural environment, the pits and competition area to gather additional data about all aspects of Core Values.

We will hold 10 minute sessions with teams that will include a Team Activity (planning still underway) for all teams. Teams are encouraged to bring a Core Values Poster as well. The session should be conducted as follows:

- 5 minutes – Teamwork Activity: When your team enters the judging room, they will be given a short, fun activity while the judges observe how the team works together.

- 2 minutes (maximum) – Core Values Poster (described below): Following the teamwork activity, team will be given up to two (2) minutes to present and describe poster content.

- 3 minutes – Questions and Answers: Time reserved for the Core Values judges to ask questions about the Teamwork Activity, the Poster and the season.

If the team does not have a poster, 5 minutes should be allotted for Q&A.

**Core Values Sample Questions:**

**Inspiration: Discovery**
- What’s the most important thing you learned this season?
- Would you still do FLL even if there were no awards? Why?
- If an FLL team can’t attend an event because there isn’t one nearby, is FLL still worth doing? Why?
- Do any of your team members mentor others? If so explain.
- What was the most surprising thing you learned this season?
- Which aspect of FLL did your team like best? Least?
- How did your team decide which aspect of FLL to do first?
- Describe any struggles your team had making sure they addressed all 3 aspects (Project, Robot, Core Values) of FLL.

**Inspiration: Team Spirit**
- How would you describe your team?
- How did your team decide its name?
- What's the most important thing we should know about your team?
- What does your team do when it is having a bad day?
- How does your team share with others your excitement and enthusiasm?
- Do you participate on any other teams (i.e., sports, debating, chess club, drama club) and, if so, is there anything different about your FLL team experience?

**Inspiration: Integration**
- Tell us what you have learned about FLL and how you think it will help you in the future.
- Name one of the FLL Core Values and explain how your team uses it (or could use it) outside of FLL.
- Who can give me an example of a way they used an FLL Core Value this year on their own away from the team?
• Does anyone have an example of someone they know (on the team or off) using FLL Core Values in a way that impressed you?

Teamwork: Effectiveness
• What were your team goals this season?
• How did you decide on your team goals?
• Tell me about a problem you had on your team and how it was resolved.
• Tell me about how your group makes decisions together.
• What do you do when your group doesn’t agree?
• How does your team solve problems that come up?
• Does your team have a set of rules? If so, what are they, and how are they enforced?

Teamwork: Efficiency
• How did your team decide what to do each time you met?
• Did your team get everything done this season that you set out to do?
• How does your team manage its time?
• If we gave your team one more week to work together, how would you use it?
• Tell us about the roles each of you had on the team and how this worked.
• How did you decide who would do each role?
• What happens if a team member is not getting his/her job done?
• Can someone else do your job? What happens when someone is sick?
• Do you have team leaders? If so, explain how that works.

Teamwork: Kids Do The Work
• What’s the most important thing you learned from your coach?
• What does your team do when it gets stuck?
• Describe a situation when your coach helped you. What did he/she do?
• What makes a good coach?
• What kinds of things does a coach need to know?
• What would your team do if it didn’t have a coach?
• How did your coach help the team be successful?

Gracious Professionalism: Inclusion
• How does your team get its ideas?
• How does your team decide which ideas they will pursue?
• Tell me about one thing each of you contributed to the team.
• What do you do when you don’t like someone else’s idea?

Gracious Professionalism: Respect
• What does Gracious Professionalism mean to you?
• How do you show Gracious Professionalism when you relate to your team? To your coach? To others?
• How do you make someone feel valued when you talk to them?

Gracious Professionalism: Coopertition
• What example of Gracious Professionalism have you seen another team do today?
• If you saw something happening to another team and thought it wasn’t fair, what would you do and why?
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- Explain how Gracious Professionalism is like good sportsmanship. And how is it different?
- Can you give an example of Gracious Professionalism that your team displayed this season?
- Competitions can sometimes be stressful. How does your team prepare each other or maybe other teams to get ready for a big event?

Look for:
- Confidence and enthusiasm of team members.
- Concrete descriptions and examples.
- Are team members listening to each other and to the judges? Are they interrupting each other or waiting their turn?
- Are team members looking at the judges when they speak or at team members when they are talking?
- Is everyone answering questions or just a few?
- Do they encourage each other to participate?
- Does the team look to the coach for direction?

Referee Overview

The robot game is the heart of the tournament and accurate scoring is the role of the referees. We will hold four matches per team – at least 48 total over the day. While each match is timed for only 2 ½ minutes, there is additional time needed to score the match, get students to sign off on the scoresheets, and setup the missions for the next round. Therefore, we will have matches scheduled every 8-10 minutes, which is still a challenge to meet. Queueers will help line up teams to ensure they are ready for the upcoming match.

The robot game is described in detail in the Animal Allies Challenge Guide, but referees should also be familiar with the table layout, mission models, field setup and rules updates.

The Head Referee will provide scoresheets and will be the final authority on rules, field setup, scores, penalties, game time, and team inquiries. We will have 1 adult and 2 student referees on each table scoring the matches. One student will mark the scoresheets and get team signatures. The other student will help observe the match, give out penalties, and reset the mission models. The adult will monitor the game table and serve as a backup. Student refs and the Head Ref will interact with teams.

We will have two game tables setup side-by-side with the long edges touching. Teams will have small side tables to place their equipment off the field. Teams have a minute to position their robot in base, check the mission models, and perform any on-field light sensor calibration. Referees will ask the teams if they are ready and then give a thumbs up to the Head Referee and emcee.

The emcee will announce the start of a match with a countdown. Team members will press the controller button and launch their robot onto the field to perform any number of missions before returning to base. Students can interrupt the robot while it is on the field and carry it back to base but they will incur a touch penalty. Additional missions can be performed until time runs out. At the end of the match, the two team members should power off the robot and then wait for the referees to score all missions. The ref will then review the scoresheet with one or both students and get them to sign off on the accuracy of the scoring. The scorerunner will then take the scoresheets to the scorekeeper for
entry into the team rankings. The tables should then be reset for the next match and all loose models should be accounted for (teams inadvertently walk off with game pieces).

Interpretation of rules should be held to a minimum. The rules are intended to be read exactly as they are written and words are used in a normal conversational manner. The order of precedence is: Challenge Updates (supercedes all), Missions & Field Setup, Robot Game Rules, and Head Referee. In the event that a team or ref questions the rules, the Head Ref can make good-faith decisions.

FLL teams around the world are constantly questioning the rules and posting questions and concerns in online forums. While these discussions are helpful, they do not provide authoritative guidance according to FLL. We will do our best to be accurate in our scoring, but ultimately the students should talk to the refs (coaches should not address the refs) to reach an agreement. If they disagree the Head Ref decides.

Referees can also take note of teams that display or fail to display Gracious Professionalism and convey that to the Core Values Head Judge for point adjustments.

Robot Game Rules

There are five sections to the game rules: Guiding Principles; Definitions; Equipment, Software, and People; Play; and Missions. Read them carefully.

Guiding Principles Highlights: Refs should give the Benefit of the Doubt in close-calls; but don’t overdo it. Fields, mats and border walls all have a degree of variability and shouldn’t be cause for a scoring debate.

Definitions Highlights: the definition of “Base” (completely in or out) is important as it dictates the safe launch and return of the robot and any objects it is transporting back to Base.

Equipment, Software, and People Highlights: Approved parts taken to the match are the only ones allowed – that means no additional spare controllers or motors can be brought along as backups if they exceed the allowable number.

Play Highlights: Robot parts that break off unintentionally can be retrieved without penalty. Anything in Base can be moved off-field and still counts as being completely in Base. At match end robots can be turned off and left in place.

Changes for 2016

Highlights: The boundary of Base has been simplified from the definition used in 2015. If you didn’t participate in last year’s game, these rule changes won’t be all that important. The quarter-circle region defined by the outer circle is the perimeter while the ceiling has been eliminated.

FLL also changed the rules to ensure that transported objects are completely in base; otherwise they are either removed from play by the ref, or left on the field where they came to rest. Teams that grab their
robot before it is completely in base will be penalized by losing the object they were transporting. Referees should remind teams to let the robot fully enter base before grabbing it.

**Missions**

**M01 Shark Shipment** – This model has a shark balanced inside of the tank. The goal is to carefully move the tank to one of two scoring positions while keeping the shark from touching the tank walls. For bonus points you are not allowed to touch the shark during the mission (to prevent it from falling over) so no attachments can be used to immobilize the shark during transport or to re-right the shark at the end of the mission.

**M02 Service Dog Action** – The rules clearly state that the Fence must be down because the Robot completely crossed it from the west, after traveling between the Barriers. This implies that the robot wheels must fit between the barriers and then drive over the fence.

**M03 Animal Conservation** – This mission starts with an animal figure placed in each of the trays (they should be different animals to score points). If either team is successful in rotating the trays, then both teams get points for all pairs (40 pts total to each in this case). To get more points, the robot has to remove the animal and replace it with another, then rotate the trays. But if the same animal is on the other tray and rotates back, both teams will lose the points for that one. This suggests that both animals need to be removed before another animal(s) is added and rotated.

**M04 Feeding** – The refrigerator dispenses eight pieces – 2 each of blue, red, yellow and green. To score points, if multiple pieces of Food are in one area, they must be the same color.

**M05 Biomimicry** – Points are given to both the White Gecko and the Robot if they hang on the wall together.

**M06 Milking Automation** – Spinning this machine will roll out milk or milk and manure. This mission is tied to M13 and M14 which determine points if the three milk pieces are returned to Base or placed on the Ramp.

**M07 Panda Release** – Should be a straightforward rotation of the slider.

**M08 Camera Recovery** – The camera is on the Seal, but will pull out if lifted by the loop. The M12 Seal in Base mission only gains 1 pt.

**M09 Training and Research** – The Dog & Trainer and Zoologist figures have loops to carry them. The Manure samples must be transported to the area one at a time. If all 7 manure samples in area, then bonus points given by M15 All Samples.

**M10 Bee Keeping** - If the Bee is placed on the Beehive, the Honey rolls out. If transported back to base it gets an additional 3 pts.

**M11 Prosthesis** – The wording on this – “Prosthesis is fitted to the Pet AND not held by the Ref” suggests that teams better get the pig completely in Base or the Farm target.
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M12 – See M08 Camera
M13 – See M06 Milking
M14 – See M06 Milking
M15 – See M09 Training

**Penalties** – Refs should hold (5) Manure Samples and use as touch penalties when the Robot is interrupted. Only five penalties can be given.

**Matches**

Matches are scheduled so that each team has a total of four rounds and hopefully they play on both tables to experience the minor variations in field setup, lighting, and table dimensions.

The scoresheets are provided to assess the end state or completion of missions. Referees use the paper copies to mark the condition of mission models – the actual score will be calculated by the Scorekeeper using a spreadsheet or app. Refs should concentrate on witnessing missions during the match and accurately recording the end state.

The Animal Allies Challenge has a large number of objects that need to be transported to Base and Target Areas on the field. It is important to adhere to the “completely in” rule for the robot and all objects.

Last year’s Trash Trek Challenge had a maximum score of over 1,000 pts. This year the max score is just over 400. With such a low max score, teams will be trying very hard to get every mission they can. The penalties and removal of objects will have a significant impact on their score, so make sure teams understand the implication of early grabbing of robots.

The practice round helps teams get used to the competition tables, but the score is not used for awards or advancement ranking. The best score of three matches is the only one that counts in official events. Some larger tournaments may use playoffs to determine the Robot Performance winner.

**The Five Parts of Robot Performance:**

**Queuing**

Teams should arrive at the dedicated queue area at least 1 match before their scheduled match. (This equates to about 8-10 minutes depending on the event schedule.) We plan to have a dedicated queuing volunteer for the Robot Game area. The queuing area will feed the table pair. Only Coaches and Team Members will be allowed into the queuing area. Parents and other guests must view from the designated spectator area. Teams will wait in the queuing area until the Referee calls them to the table.
Approaching the Table

Teams are allowed to bring the following to the table:

- One robot in compliance with all the Robot Game Rules
- (optional) A box to store items outside of base
- (optional) A TV tray to set the box on [we plan on providing this]

They should NOT bring the following:

- Another robot or any other electrics for mission activity, including a computer. Programming must be done in the pits.
- Any mission models. You must use the ones provided at the table.

Only two team members may be at the table at any given time, including before and after the match. The rest of the team must stand behind a designated line (about 3-5 feet from the table). Coaches may not approach the table before, during, or after a match unless to help the team move bulky/large equipment before/after a match.

Before the Match

The team should get their robot and all materials set up on the table and get ready to go. Teams will have at least one minute to get their robot ready, but may have more time depending on the schedule of the event. Any additional setup actions as required by the Robot Game are also completed during this time.

Tables are set up by one of the referees at our tournament. It is crucial that the team verifies the setup of the field. In the event they feel there is a discrepancy, then they must notify the Referee BEFORE the match starts. Teams are not allowed to touch the field outside of base, except as described in the rules. Once the match starts, the field cannot be changed even if it was setup wrong.

The match starts at the end of the countdown sequence. At our tournament, the countdown is “3. 2. 1. LEGO!” Per the Challenge rules, the official start of the match is defined as the moment the first syllable of “LEGO” is spoken. A timer starts the countdown from 2:30.

Please try to keep any official mission models on the table and prevent teams from accidently carrying them off.

During the Match

The match lasts for 2 ½ minutes. During this time, only two team members are allowed at the table, with the rest of the team standing back a few feet from the table (usually designated by a line of tape on the floor). Members at the table are called Technicians in the official rules. Other team members will be allowed at the table in the event of a catastrophic robot failure. Team members at the table may swap out with team members standing back from the table. Members may also hold equipment when not at the table to assist with an upcoming mission.

Teams will run their robot on the field for the duration of the 2 ½ -minute match. The robot may return as many times as necessary to Base and team members may only interact with the robot in Base.
Interacting with the robot or models outside of Base is not allowed and maybe subject to penalties as described in the Challenge Rules.

The match ends right when the buzzer sounds and the Referee will score the field based upon the state of the field when the buzzer started sounding. Teams should stop their robot as soon as the buzzer sounds. Any modifications to the field after the buzzer sounds are ignored.

**After the Match**

Once the buzzer sounds, only two team members will remain behind with the referee. The rest of the team (including coaches) must head to the Team Waiting Area to wait for the remaining team members at the table. The team should take as much of their supplies as possible with them. Anything on the table should be left alone until the Referee clears the table for reset. Remind teams not to take any Mission Models!

The team should not touch the robot or the field unless instructed by the Referee, except for stopping the robot as indicated in rules. Once the Referee finishes scoring the table, he/she will go over the score sheet with the team. Once the team members initial the score sheet, the score is considered final and the referee will clear the field for reset. The team members at the table will collect their remaining robot materials and rejoin their team.

**The Head Referee**

Teams with any comments or questions regarding their match should consult with the Head Referee for the tournament. Only student team members may talk with the Head Referee. The Head Referee’s job is to ensure consistency and fairness throughout the competition. Any decisions made by the Head Referee are considered final.

**Requesting a Score Verification**

As mentioned above, the score sheet is considered final once the team members sign the score sheet. However, there are situations where the score sheet does not get properly entered into the scoring computer. If a team feels that their score sheet was not entered properly, a student team member can approach the Head Referee and request that the score be verified.

The Head Referee will then decide if a score verification is necessary. All score sheet verifications will occur at the discretion of the Head Referee.

**Award Structures**

One of the main reasons for teams to participate in a practice tournament is to gain experience in the many facets of the judging and robot performance. FLL Qualifying Tournaments have a number of awards that are given to teams in the form of a LEGO trophy.
Although we will NOT be presenting awards at our practice tournament, Judges and Referees should be familiar with the Awards in order to understand the motivation behind the teams. In Qualifying Tournaments, FLL require that ~30% of teams receive an award. With 24-32 teams, this means that 8+ awards are given.

**Advancement from Qualifier to Championship**

In addition, the top 20%-30% of teams in a Los Angeles or Tournament advance to the regional Championship. The top teams at that tournament go on to the Worlds in the spring of 2017. FLL’s qualifier advancement policy is based on Champion’s Award criteria which require that the team, performs well in all three judged areas (Project, Robot Design and Core Values) and receives a Robot Performance score in the top 40% of official Robot rounds among other requirements.

**Champion’s Award**

The Champion’s Award recognizes a team that “embodies the FIRST LEGO League experience, by fully embracing our Core Values while achieving excellence and innovation in both the Robot Game and Project.”

At an official event Judges will look for balanced, strong performance across all three areas; this means that all three judged sessions (Core Values, Robot Design, and Project) are weighted equally to determine the initial group of Champion’s candidates. All candidates must also meet the following requirements:

- **Robot:** The team must score in the top 40% of all teams participating in the Robot Game at the event.
- **Project:** The team must complete all parts of the Project, including the identification of a real world problem related to the Challenge theme, creation of an innovative solution and sharing their research and solution with others, as well as any other season-specific requirements that may exist.
- **Core Values:** The team must adhere to all Core Values throughout the event and the season.

All candidate teams are then reviewed during a deliberative process that considers Robot Performance placement and other qualitative factors. Final determination of the award winner(s) is based on a vote of the full judging panel.

**Robot Awards**

- **Mechanical Design** - This award recognizes a team that designs and develops a mechanically sound robot that is durable, efficient and highly capable of performing challenge missions.
- **Programming** - This award recognizes a team that utilizes outstanding programming principles, including clear, concise and reusable code that allows their robot to perform challenge missions autonomously and consistently.
- **Strategy & Innovation** - This award recognizes a team that uses solid engineering practices and a well-developed strategy to design and build an innovative, high performing robot.
• **Robot Performance** - This award recognizes a team that scores the most points during the Robot Game. Teams have a chance to compete in at least three 2.5 minute matches and their highest score counts.

**Project Awards**

• **Research** - This award recognizes a team that utilizes diverse resources to formulate an in-depth and comprehensive understanding of the problem they have identified.

• **Innovative Solution** - This award recognizes a team’s solution that is exceptionally well-considered and creative, with good potential to solve the problem researched.

• **Presentation** - This award recognizes a team that effectively communicates the problem they have identified and their proposed solution to both the judges and other potential supporters.

**Core Values Awards**

• **Inspiration** - This award celebrates a team that is empowered by their FIRST LEGO League experience and displays extraordinary enthusiasm and spirit.

• **Teamwork** - This award recognizes a team that is able to accomplish more together than they could as individuals through shared goals, strong communication, effective problem solving and excellent time management.

• **Gracious Professionalism®** - This award recognizes a team whose members show each other and other teams respect at all times. They recognize that both friendly competition and mutual gain are possible, on and off the playing field.

**Judges Awards**

During the course of competition, the judges may encounter teams whose unique efforts, performance or dynamics merit recognition. Some teams have a story that sets them apart in a noteworthy way. Sometimes a team is so close to winning an award that the judges choose to give special recognition to the team. Judges Awards allow the freedom to recognize remarkable teams that stand out for reasons other than the Core Award categories. Examples include:

• **Against All Odds or Overcoming Adversity or Perseverance**. This award goes to the team that improvises and overcomes a difficult situation while still making a respectable showing, with an attitude that shows, “We can overcome incredible odds if we never give up, no matter what!”

• **Rising Star** - This award recognizes a team that the judges notice and expect great things from in the future.

**Special Recognition Awards**

• **Outstanding Volunteer Award** - The FIRST LEGO League program would not exist without its volunteers. This award honors an extraordinary volunteer(s) whose dedication to the program has a positive impact on the team experience.

• **Coach/Mentor Award** - Coaches and mentors inspire their teams to do their best, both as individuals and together. This award goes to the coach or mentor whose leadership and guidance is clearly evident and best exemplifies the FIRST LEGO League Core Values.
Resources

FIRST
• FIRST Home Page: http://www.firstinspires.org/
• FIRST Facebook Page: https://www.facebook.com/FIRSTOfficial/

FIRST LEGO League
• FLL Home Page: http://www.firstinspires.org/robotics/fll
• What is FIRST LEGO League video: http://www.firstinspires.org/robotics/fll/what-is-first-lego-league
• FLL Facebook: https://www.facebook.com/FIRSTOfficial/

2016 Animal Allies Challenge
• Challenge Guide: http://www.firstlegoleague.org/challenge

Los Angeles FLL
• LA FLL Home Page: http://www.la-fll.org
• LA FLL Facebook: https://www.facebook.com/LosAngelesFLL/

Redondo Union High School
• Beach Cities Robotics #294 (w/Mira Costa H.S.): http://www.bcrobotics.org

Parras Middle School
• Parras Middle School Home Page: http://pms-rbusd-ca.schoolloop.com/cms/page_view?d=x&piid=&vpid=1244185282249
• Parras Robotics: http://www.parrasrobotics.com