10 Things to Know as an FLL Judge

Rubric

Sample Questions

Smart Move Project

Smart Move Project Resources
10 Things to Know As an FLL Judge

Thank you for agreeing to be a judge with FIRST® LEGO® League. The information in this packet is designed to help you prepare as an FLL Judge this season. It serves as a supplement to the FLL Judges’ Handbook and is intended to offer background information that will be useful to review prior to your tournament. You should also participate in training sessions that may be offered through your local tournament organizer and/or FLL. We hope your experience as an FLL Judge is rewarding and enjoyable!

10. Have fun – you and the kids
The most important thing to know about an FLL tournament is that it is supposed to be FUN. The mission of FIRST® is to get kids excited about science and technology. A competition is a celebration of what the children have accomplished throughout the season. It should be serious and competitive, but not so much that the fun is lost.

9. Exhibit Gracious Professionalism and honor FLL Core Values
These are the basic foundations of FIRST® LEGO® League, and should always be at the forefront in everyone’s minds.

8. Be a good role model for technology and engineering careers
Give the kids a chance to see what makes engineers, scientists, computer programmers and educators special. Share your experiences without sharing your agendas. Be professional – show the kids that what they have accomplished is appreciated and valuable. Show interest in their presentations and discussions, and be personable.

7. Respect the children
Please keep negative comments to yourself, away from the ears of the kids, parents, and coaches. All teams should be given the benefit of the doubt when questions arise about adult involvement. If you suspect the kids did not do the work, it is your job to probe further to prove it, rather than assuming that the kids did not do the work. Remember that these are kids who worked hard all season to make it to the tournament. Treat their accomplishments with respect, and be sure that other judges do so as well. One negative comment from a judge can have a devastating effect on teams. Make it your goal as a judge to ensure that the teams know what they did well, and that they have a positive experience showcasing their achievements.

6. Respect the judging process
Stay on schedule. The kids have a more challenging schedule than you do. Remember the FLL awards philosophy. Remember that the whole judging process is subjective. Concentrate on providing a great experience for the kids and try not to get caught up in the mechanics of the process. Do not share scores or awards discussions with the kids, coaches or parents.

5. Evaluate teams completely and fairly
Each rubric is designed to evaluate many areas of a team’s performance, and gives equal weighting to several factors. All factors are of equal importance. Be objective, both on a team-by-team basis and a total rubric evaluation basis. Familiarize yourself with the levels of achievement. Identify any conflicts of interest you have before the competition, and refrain from involving yourself in discussions about any team when you have a conflict.

4. Consider age appropriateness and experience
Consider age when evaluating teams. Certain skills, knowledge, and capabilities are more likely to be exhibited by the kids as they get older and more experienced in general and in FLL in particular. You may also see rookie teams that are more polished and understand FLL better than experienced teams.

3. Reward excellence and celebrate achievement
For a team to be considered for an award, they should be evaluated at an Excellent level of achievement in that category whenever possible. Award distribution is spread as equitably as possible among the teams, with the goal of no team winning more than one award.

2. Provide specific and constructive feedback
Please be specific when providing feedback comments to teams. This will also help when it comes to awards deliberations – specific examples are very helpful when differentiating between teams. “This team’s willingness to help other teams (by providing programming mentorship, for example) is exemplary” is more descriptive and helpful than “that team was so nice and polite and exhibited gracious professionalism.” Take lots of notes if you need to!

1. See #1 again!
<table>
<thead>
<tr>
<th>Needs Improvement</th>
<th>Fair</th>
<th>Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>** No clearly defined research problem or it does not relate to the FLL theme</td>
<td>Research problem is vague or relates poorly to FLL theme</td>
<td>Research problem is fairly clear and concise, and relates fairly well with FLL theme</td>
<td>Research problem is explained clearly and concisely, integrates well with FLL theme</td>
</tr>
<tr>
<td>No outside sources used in research</td>
<td>Limited outside sources used in research or few mentioned</td>
<td>Cited a diverse variety of outside sources used in research</td>
<td>Cited multiple sources used in research including communication with a professional(s) (or attempts to)</td>
</tr>
<tr>
<td>No research on the impact of the problem</td>
<td>Limited research on the impact of the problem</td>
<td>Impact of problem clearly researched</td>
<td>Impact of problem thoroughly examined and applied to solution</td>
</tr>
<tr>
<td>No research on existing solutions or technologies used to address the problem</td>
<td>Limited research on existing solutions or technologies used to address the problem</td>
<td>Present solutions and technologies clearly researched but not considered in developing solution</td>
<td>Clearly researched existing solutions and technologies, applied knowledge when developing solution</td>
</tr>
<tr>
<td>Alternative theories or interpretations ignored, no clear arguments</td>
<td>Alternative theories or interpretations dismissed and/or arguments obscured by jargon</td>
<td>Considered alternative theories or interpretations and presented clear arguments</td>
<td>Alternative theories or interpretations presented and addressed in persuasive arguments</td>
</tr>
<tr>
<td>Did not demonstrate understanding of technical terms</td>
<td>Demonstrated a limited understanding of technical terms</td>
<td>Demonstrated understanding of technical terms but didn’t explain them clearly</td>
<td>Demonstrated and shared a complete understanding of technical terms</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Research</th>
<th>Innovative Solution</th>
<th>Sharing</th>
</tr>
</thead>
<tbody>
<tr>
<td>** No solution presented</td>
<td>Solution is unclear</td>
<td>Solution is described but not clear how it addresses the problem</td>
</tr>
<tr>
<td>No data presented in support of proposed solution</td>
<td>Weak or limited data to support proposed solution</td>
<td>Adequate data supports proposed solution</td>
</tr>
<tr>
<td>Solution is not innovative or new</td>
<td>Solution is somewhat innovative, or limited knowledge of science and/or technology applied</td>
<td>Solution is innovative and applies some knowledge of science and/or technology</td>
</tr>
<tr>
<td>** Did not share their project, research or solution with anyone outside team</td>
<td>Shared their project, research or solution with team parents</td>
<td>Shared their project, research or solution with others beyond parents such as a class, sponsors, or other teams</td>
</tr>
<tr>
<td>Did not consider how their problem and/or solution might impact themselves or consider what changes to make</td>
<td>Considered how this might impact themselves or their family, but did not consider changes</td>
<td>Considered how this might impact themselves and their family and recommended changes</td>
</tr>
<tr>
<td>Needs Improvement</td>
<td>Fair</td>
<td>Good</td>
</tr>
<tr>
<td>-------------------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>Presentation rambles</td>
<td>Presentation organization is weak</td>
<td>Presentation organization is clear, integration and/or logical progression could be improved</td>
</tr>
<tr>
<td>Limited number of team members participated in project presentation</td>
<td>Less than half of the team participated</td>
<td>Most of the team participated in the presentation</td>
</tr>
<tr>
<td>Unable to answer judges’ questions</td>
<td>Weak answers to judges’ questions</td>
<td>Adequate answers to judges’ questions</td>
</tr>
<tr>
<td>Team member ideas were not integrated</td>
<td>Team member ideas not well-integrated</td>
<td>Project is a group effort</td>
</tr>
<tr>
<td>No visual aids or support material</td>
<td>Ineffective visual aids or weak support material</td>
<td>Visual aids or support material complement presentation</td>
</tr>
<tr>
<td>Lacks excitement or creativity</td>
<td>Information presented with limited creativity</td>
<td>Team uses creativity doing presentation</td>
</tr>
<tr>
<td>Excessive adult intervention</td>
<td>Adult intervention is apparent</td>
<td>No apparent adult intervention but difficulty with setup/take down within allotted time</td>
</tr>
<tr>
<td>Many errors or not rehearsed</td>
<td>Few errors or should have rehearsed more</td>
<td>Very few evident errors, well rehearsed</td>
</tr>
<tr>
<td>Too long</td>
<td>Slightly too long</td>
<td>Proper length</td>
</tr>
<tr>
<td>Plagued with technical difficulties</td>
<td>Several technical difficulties</td>
<td>Very minor technical difficulties</td>
</tr>
</tbody>
</table>

If any of these boxes are checked or highlighted, team is not eligible to be considered for any Project awards. Team must complete all elements of the Challenge Project assignment to be considered for Project awards.

Additional Comments:
**Project Sample Questions**

**Research Quality**
- What resources did you use to research your problem and why did you choose these?
- Did you use any unusual methods to research your topic? If so what and why?
- Did the information you used offer different ideas than what you expected to find? If so, what and how did your team use this information?
- Did you speak to anyone whose work relates to the Challenge area? What did you learn from them?
- Can you tell us about a problem you discovered or something that you learned that surprised you while completing this project?
- After working on this project, what is the most important thing that your team learned?

**Innovative Solution**
- What makes your solution different from what is being used to solve this problem now, and why do you think it is better?
- How did you arrive at your solution and why?
- Were there solutions that you thought of that you decided not to use? Why?

**Project Sharing**
- With whom did you share your project? Why did you choose that individual or group?
- 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?

**Creative Presentation**
- How did you decide on this presentation style that you used?
- Why did you choose the presentation style that you chose? How does this style help your audience understand what you are telling them?
- What do you think was the most creative aspect of your presentation or project and why?
- One aspect of the project asked you to share your ideas with others. How did your team do this?

**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?
Each and every day, transportation touches your lives. Your team travels to the places where they learn, to the places where they play, to visit friends and family. Things we want, clothes we wear, the food we eat, the water we drink, medicines we need—all these travel over highways, on paths and trails, along railroad tracks, up and down rivers, across oceans, over mountains and deserts, along the streets we live on. Information travels to us from experts, teachers, friends, and family. It comes to us by word-of-mouth, over the phone, in books, from websites, in text messages.

Now, consider. A potato chip can travel through a factory—flying from machine-to-machine without being broken—but more than 50,000 kids who traveled on skateboards had to be taken to the hospital. Is all this travel as safe as it could be? Millions of people (and the things they need) get stuck in transit every day. Is all this travel as efficient as it could be?

Your challenge this season is to look at your community and discover how people, animals, information, and things travel. Once you know how people and things move in your community, pick one main mode of transportation and do some research. What kinds of problems keep people and things from getting where they are going safely? What kind of problems keep people and things from moving efficiently, getting where they are going quickly and using the least amount of energy? How could your team help solve one of those problems?

**IDENTIFY A PROBLEM**

Begin your project by describing your community. This season, it is up to your team to define your community. Is it your school? your neighborhood? your city, village, or town? your country? the world? Be prepared to share how you defined your community.

Next, create a list of the ways that people, animals, information, and things move in, around, to, and through your community. Be creative. Be silly. Be serious. Think about *everything* that gets moved, including yourselves!

Once your list is complete, pick one way that people and things move in your community and learn more about it!

Whether your team chooses planes, boats, trains, cars, trucks, skateboards, rollerblades, bicycles, donkeys, llamas, camels, your feet…it’s time to research. What makes your mode of transportation dangerous? What prevents people, information, animals, and things from getting where they need to go? What makes them take longer? What makes them burn more fuel? Search out the problems. Look at reports. Read books. Browse websites. Conduct a survey. Check with experts who work in and around your community. Use any research tools you have available. Be prepared to share your information sources.
CREATE AN INNOVATIVE SOLUTION

Choose one of the problems and suggest a solution. What can be done to fix the problem? What will it take to make your team’s solution happen? How will your solution help your community? How can your team make moving from one place to another safer and easier? A great solution might take all the imagination and ingenuity your team can muster. It might seem so obvious that you wonder why the problem even exists. And remember, the most important thing is to have fun while you make a Smart Move.

SHARE WITH YOUR COMMUNITY


Your presentation to the judges can be simple or elaborate, serious or designed to make people laugh while they learn—but to be eligible for project awards at tournaments, it must:

✦ Describe your community, the problem, and your team’s solution
✦ Show that your team did the research and tell about your information sources
✦ Be shared with someone outside of your team

Note: The total length of your project presentation at a tournament or qualifier should be no more than five minutes, including any setup time.

NEED HELP GETTING STARTED?

The 2009 Smart Move FLL Coaches’ Handbook contains more information about FIRST LEGO® League, the Smart Move Challenge, tournaments, awards, and scoring. Be sure to look at the project rubric.

Information and resources are also available online.

If you have more questions, email flprojects@usfirst.org for project support or fltech@usfirst.org for game support.
NOTE: Chapter 5 of the FLL Coaches’ Handbook (4th Edition) has additional resources about completing the project.

Why a Project?

The exploration of the FLL project is critical to the overall Challenge experience. FLL is not just about building and competing with robots. It is about making connections between the robot missions, our scientific understanding of the Challenge theme, related problems and innovative solutions.

FIRST encourages its teams to be well-rounded. Any successful engineering or technology project requires a wide variety of skills and abilities. For example, the Mars Rovers would not have been as successful if the NASA team working on them did not have people who know about the climate and terrain the robots would face on Mars working with the designers and engineers.

Before getting started on this year’s project, we highly recommend that your whole team watch the Challenge Project Training DVD. Keep in mind, however, that the steps of the project have shifted since the DVD was developed. Therefore it is essential to refer to the project assignment and kickoff material posted on the FLL website for the most up-to-date information about the project.

Getting Started

Specific instructions for this year’s project will be posted on the FLL website at kickoff. Generally the project has three steps:

- through research, identify a real world problem related to the Challenge theme,
- create an innovative solution,
- and share your research and solution with your community.

Read this year’s project very carefully before getting started.

To qualify for awards your team needs to share all three steps of the project through a creative and informative presentation with judges at an FLL event.

Although the project may seem daunting at first, if you break it down into smaller parts it becomes more manageable. There is a sample schedule in Chapter 9 of the FLL Coaches’ Handbook outlining how your team can complete the project over eight weeks.
The Specifics

Identify a real world problem

You can start to identify your team’s focus for the project by:
1. Reading the assignment very carefully with your team. Allow team members to ask questions to clarify any parts that they do not understand.
2. Discussing the theme as a group and brainstorm some general ideas about the topic.
3. Choosing three or four main ideas and then break the team into small groups to research these ideas. A list of good sources of information is available at the end of this guide.
4. Coming back together as a team and sharing the results of the research.
5. Deciding which aspects of the research are the most important and/or relevant to the project. Rank the ideas by importance.

Create an innovative solution

Your team needs to agree on one unique solution to your problem. Innovative means the solution is not already in use by someone else. It can be a new idea or an improvement on an existing idea. To do this, you may want to develop ideas individually or in small groups and then present them to the team, or you may want to collaborate on an idea together. If starting separately, consider combining the strengths of several solutions to create a final solution.

1. Brainstorm ideas with your team
2. Begin to develop a variety of designs
3. Draw pictures of your proposed solutions and/or innovations to current solutions
4. Present each possible solution to the team
5. As a team, select one solution to focus on (this design may combine the strengths of several designs)
6. Come together as a team to improve upon your chosen solution
7. If it makes sense, build a prototype of your solution

Share your research and solution

This step is critical to completing the project and is not just about practicing your presentation. It is a chance for your project to make a difference. It is an opportunity to share the excitement of science and technology with others. This may even be an opportunity to motivate others to act.

1. Brainstorm who you can share your findings with such as your school, a governing group, a local company, a community organization, or other FLL teams. Think about who would be most interested in what you have learned and/or who might be able to use the information positively.
2. Select who you want to share your findings with and make arrangements for the presentation to be completed prior to developing your project presentation for your FLL event.
3. Organize and prioritize the information you want to share.

Deciding what to share with the judges

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Since you have only five minutes for your project presentation at FLL events, you must carefully select the information you will include on the basis of:

- Importance to the project theme
- Aspects on which you have solid information and data.
- Information and data that relates closely to the problem you have focused on and innovative solution you have created.
- Material that fits your team's presentation style or format.
- Relevance to the three steps of this year's project.

**Deciding how to share with the judges**

In the final process of developing the presentation there are four major considerations:

- Showing how you achieved all project objectives and all three steps of the project.
- Selecting a creative format or style of presentation that complements your information and team member skills. (The options are broad, including but not limited to a discussion, formal presentation with props, skits, songs, music and/or video.)
- Using the project rubric found in the back of the current *FLL Coaches' Handbook*, as a guideline for what judges will look for and paying close attention to qualities listed in the excellent column.
- Setting a standard of quality. (See below how you can understand the FLL standard of quality for project presentations.)

**Polish and perfect**

Take some time to discuss the following suggestions as a team. This way, everyone understands what will help make the work easier and the end result more successful and fun.

1. **Standard of Quality**
   The best way for your team to understand the standard of quality for project presentations is to see some presentations. Some FLL tournaments allow team members and the public to view all project presentations. If this is true at your event, take advantage of it! At other FLL tournaments the best presentations are part of the closing ceremony. If so, pay attention!

   You can also ask another team to rehearse their presentation for you or watch the presentations available on the Challenge Project Training DVD. The Minnesota-based FLL organization called “High Tech Kids” provides examples of winning presentations from previous years at www.hightechkids.org

2. **Understand and achieve the objectives**.
   Past experience shows that the most successful projects and their presentations are guided by the FLL theme and project guidelines. The first step in developing your project, therefore, is a complete understanding of the theme and the guidelines for this year.

3. **Involve the Community**
   Your community is a very important source of support and help. Draw on members of your community for advice, resources, information and guidance. Community organizations will promote your team’s involvement in the FLL project when you demonstrate mutual interests.

4. **Survey team’s talents**
This is your team’s chance to shine! What can team members contribute to make the presentation special? Are any students interested in the arts ... playing instruments, acting, singing or poetry? Do any have special technology talents regarding websites, video animation, etc? Start from these strengths and design your presentation around them.

5. Practice, Practice, Practice
Finally, your practice sessions should also include questions and answers. You may want to consider inviting parents, teachers, or other students to view a dress rehearsal of your presentation. This critical audience can ask questions of the team, give feedback, and support the team by offering positive encouragement.

Sources of information

- Published sources, such as:
  - The FLL website includes a project guide each season with links to useful information and activities.
  - Libraries
  - Government agencies
- Knowledgeable people and organizations:
  - Scientists or professionals whose work relates to the theme. They may be local or contacted by phone, mail or email. Don’t forget to check with team parents!
  - Community organizations with interest in the Challenge topic.
  - Universities and colleges that have experts in the field.
  - Corporations whose businesses relate to the theme.
  - High schools or other schools that teach these topics.
  - Tour a business related to the theme.

Keep in mind that knowledgeable people may come from all walks of life!
Talking with experts who work in the field of the Challenge theme is a great way for your FLL team to learn more about the topic, find out current data, discover potential problems, and learn what is being done about those problems. Experts can include a variety of people like scientists, engineers, community leaders, university professors and students, and anyone whose life or work is affected by the Challenge theme.

Preparing for Your Interview

You should contact your expert well in advance to see if they are able and willing to help on your project. Find out their preferred way to conduct the interview (in person, over the phone, electronically). Set up a time and start getting ready for the interview.

Before the day of the interview, your team should prepare a list of questions. Plan for concise, to-the-point questions that will help you achieve your project goals and make the best use of your time with the expert. Try to anticipate how long it will take for all the questions and answers so you can keep the interview in the scheduled time length. Keep your questions to the topic of your specific presentation.

It is helpful to write down your questions and have them in front of you when you are interviewing. You may even consider sending a list of questions to your expert in advance so they can properly prepare. Decide ahead of time which team member(s) will ask each of the questions. Always remember to exhibit Gracious Professionalism during your interview and be respectful of the time given to you by the expert. Treat the expert like a member of your team and remember to thank them for their contribution!

Smart Move Experts and Sample Questions

Transportation Experts

Certain types of experts who work with transportation issues everyday may be particularly helpful to talk with for your project. These may include:

- Information Technology (IT) specialists
- Mayors
- Regional or urban planners
- City or town council members
- Air traffic controllers
- Community leaders
- Lawmakers
- Auto engineers
- Internet service providers
• Import/export business owners
• School bus company employees
• School principals and superintendents
• And many, many more!

Research Questions

There are certain questions you should answer through research prior to interviewing any experts. These will help everyone on your team have an understanding of the basic project and Challenge elements.

Some of these questions may include:

• How does our team define our community?
• How do transportation problems affect our lives?
• What forms of transportation are available in our community?
• Which forms of transportation does our team use? Which ones do we wish we could use?
• Who is affected by problems with transportation? How are they affected?

Interview Questions

As you prepare for your interview, you will need to think of questions that specifically address the project topic your team has selected. However, some teams may talk to experts before selecting a specific problem and the questions below are a helpful guide to get you started.

Some sample interview questions include:

• How did you get into your career?
• What is the most important transportation question facing our area?
• Do you know of any other areas in the world facing similar transportation challenges?
• How do you improve transportation in your job?
• How could our transportation network be made safer? Or, how could our vehicles be made safer?
• How do you think transportation could be improved in our area?
• Do you think our community’s transportation system works well for children? The elderly? Adults?
• What can be done to make our community’s transportation network more efficient?
• What advice can you give the next generation about fixing transportation problems?
• What do you think transportation will be like in the future?
• How do you think we will get the things we want and need in the future? How might we get to school? Work? Our groceries? Information?
Web Resources

Transportation Security
Learn about Transportation Security
Website created for FLL Teams, sponsored by the Department of Homeland Security (DHS) National Transportation Security Center of Excellence (NTSCOE)

Careers, Professional Organizations, and Research Organizations
Official Kids’ Portal to the US Government: Careers
American Society of Civil Engineers
University of Michigan SMART
SMART undertakes research, demonstration projects, education, and global learning exchange on a range of issues related to the future of transportation in city regions around the world.
Institute for Transportation & Development Policy
World Business Council for Sustainable Development Mobility Project
Transportation for America

Regional Planning, Sustainable Growth and Specific Examples
Some predictions about transportation in the 21st century based on interesting statistics (such as age of population and internet access)
Great information about factors considered in regional planning
Information about trends toward sprawl and urban clusters
The New Mobility Agenda
Reconnecting America

Specific Examples & Systems
Inspire Mobility blog
How the city of Boston uses various modes of transportation
Multi-modal transport hub at the Hong Kong International Airport
European cities

Forms of Transportation
Rails West - studies the current status and history of U.S. railways
Information about sustainable transportation
smarttransportation.org
Non-profit organized to increase the awareness and availability of clean technology in the transportation sector across the US. Site has a lot of information about hybrids and other alternative vehicles.
Article about Smart Bikes and bike sharing programs

Specific Technologies
How Stuff Works: Maglev Trains
GPS
An explanation of GPS from NASA
How Stuff Works: GPS
Garmin
Specific Garmin GPS devices
Triangulation and how it is used
Tons of resources about GPS, transportation, and mapping.
The format seems a little daunting at first, but contains lots of info about cool advances.

**Navigation**
General Aviation
Information on air navigation
The possible future of air traffic control

**Cartography**
Online aeronautical charts