



## Project How-To Guide

**NOTE:** Chapter 5 of the FLL Coaches' Handbook (4<sup>th</sup> 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**

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](http://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!