Building a Team

Coaching can be one of the most rewarding experiences of your life. Our goal is for you to help the children have fun while they get comfortable with technology and learn something about a real-world problem. Whether or not your team scores high marks at a competition, team members win just by participating.

If it is your rookie year, enjoy it for what it is: a survey of the course. Your goal should be to simply take a lap around the block with FLL. With a fun experience and meeting realistic goals under your belt, you and the children will be brimming with ideas about what to do next year.

THE TEAM’S FOUNDATION

Teams require at least one adult coach. Lots of people make good coaches: parents, teachers, engineers, college students, and scout leaders. It requires no special expertise, just patience, dedication, and a willingness to learn alongside the team. You facilitate the process the team follows without providing the solution yourself. The children need you to give them guidance and provide structure, encouragement, and most of all, a fun experience.

You must be willing to acquire basic knowledge of the FLL Challenge, including the Robot Game and Project, the NXT or RCX programming environment and LEGO® robot building. We encourage you to enlist the support of a technology, programming or engineering mentor or guest speakers if you feel the need. We also recommend that you invite professionals with backgrounds in the science of the Challenge theme to share their knowledge and experience with your team.

You are not in this by yourself! Recruit an assistant coach, mentor(s), parents or guardians, and guest speakers to help. Others can help with team communication, host meetings, contribute technical expertise, lead fundraising, and provide additional adult supervision. Try to plan a meeting schedule that accommodates the participation of other adults.
The Children

Your FLL team may have up to ten (10) children, and all children must meet the age requirements in your region. In the US, Canada, and Mexico, team members may be ages 9 to 14. In other parts of the world team members may be ages 9 to 16. Check with your Operational Partner if you have any questions about the age requirement in your region.

To be eligible, a child must not exceed the maximum age on January 1 of the year the Challenge is released. For example, in the United States a student who turns 15 in May of 2012 would be eligible to compete in the Challenge released in the Fall of 2012, whereas a child who turned 15 in December 2011 would not. Children can be members of only one FLL team per season.

Limiting your team to ten members may be difficult, but it is important not to exceed this limit. This kind of decision is often faced by coaches of other team sports. If you have more than ten children interested in joining your FLL team, please consider registering a second team or use a selection process to decide who may participate on your team.

It is important to be fair to everyone by limiting the number of children who participate on your team. Only ten or fewer children should participate on your team per season. This means only ten children may work on the robot or Project, and only those same ten children may attend an event.

The Coach

FLL encourages fresh thinking. Let your team celebrate its own style. Do what makes sense for you. With that said, we expect coaches to follow certain guidelines.

As much as you might like to build it, the team must design and build the robot, not you or any other adult. If you find yourself pushing a solution, you’re doing your team a disservice. Not only are children not thinking for themselves, but you may also suppress a revolutionary idea. Additionally, a coach or mentor doing the work sends the children the message that they are not capable of doing it themselves.

FLL defines children doing the work as children making all critical decisions in the robot-building, programming, the Project development, and presentation.
Does this mean you should stand idly by while your team struggles? Absolutely not! Instead of telling the team to “build a gearbox using a worm gear,” you could ask the team to brainstorm ideas to make the robot go slower. Or you could encourage the children to run an experiment that may lead them to explore other options.

Coaches differ in how much instruction they give their teams. Some give very little and others give much more. A successful FLL coach controls the process, not the content. You are a facilitator to help your team complete its work and improve the way it works together. One useful coaching method is to reply to a question with another carefully considered question. The following examples force team members to use their knowledge of science and hypothesize logical outcomes:

“What would happen if . . .?”
“And then . . .?”
“How will that affect . . .?”

Children become problem solvers by finding solutions themselves! We understand that adults can be just as passionate about FLL as children, but adults must always remember that THE CHILDREN COME FIRST.

You are also responsible for guiding the team in developing its goals and timeline, as well as the planning and scheduling of meetings, visits, and trips. You are the liaison between team members, mentors, parents, and volunteers. It is important that you inform children and parents about what is expected of them in terms of their

**TIP**

*Do not worry if you are not an expert on some skill or aspect of the Challenge. You can work through it with your team. In fact, it may benefit your team. Children love to solve problems that befuddle adults. It promotes creative thinking among children when you encourage them to find their own answers.*

**TIP**

*Like other team activities, FLL has rules. As the coach, you can (and should!) remind your team about the rules when appropriate. As long as you are not making decisions for the team or doing the work, keeping the team on track would not be considered adult interference.*
commitment to the team each step of the way.

You will need a valid email address to maintain contact with FLL throughout the Challenge season. FLL communicates through the primary email address you provide when you register.

The Mentors

A mentor is any person who works with the team in his/her area of expertise for at least one team meeting. Mentors help provide valuable one-on-one interaction and serve as resources in their specialties. In addition to having a needed expertise, the most important quality for a mentor is someone who enjoys working with young people and wants them to learn.

When recruiting mentors, consider their ability to work with the FLL age group. They need to be role models and commit to FLL’s Core Values and Gracious Professionalism™. Talk to them about:

- Adapting their knowledge to an appropriate level for the team members;
- The team’s goals, the timeline, and structure of the meetings;
- Guiding the team to find the answers to their own questions;
- The importance of acknowledging all team members, getting everyone to contribute and participate and providing positive feedback and encouraging responses.

**REMEMINDER**

Adults may teach your team members new skills and information or ask questions to get them thinking. However, the kids should make all the important decisions as well as doing all the work on the robot and Project. Inappropriate adult intervention could result in your team losing the opportunity to compete for awards at a tournament.
Here are some mentor types and possible team contributions:

- **Engineer** – Teaches skills the team can use to design their robot or complete the Project.

- **FIRST® Robotics Competition (FRC®) or FIRST® Tech Challenge (FTC®) team member** – Helps the team work through a practice programming challenge, shares strategizing methods, serves as a possible youth role model.

- **FLL Graduate** – Helps the coach guide the team, provides assistance with troubleshooting.

- **Science professional** – An expert in this year’s Challenge theme, presents real examples of science in practice, advises the team on the Project, describes existing solutions, and recommends new sources of information for the team to explore.

- **Graphic artist** – Provides advice on the team logo, T-shirts and presentation material.

- **Carpenter** – Provides carpentry assistance for building the practice game table.

- **Programmer** – Teaches the team about programming principles and helps the team troubleshoot programs.

- **Marketing expert** – Teaches the children about marketing the team to others and ways of sharing their research with the community.

Potential sources for mentors might include:

- Companies in your community. Many companies encourage their employees to volunteer, and some even have formal programs to match volunteers with groups in the community. For example: IBM On Demand Community.

- Service-oriented organizations. There are many social organizations with a focus on community service. You probably have some in your town. For example: Rotary clubs or Senior Corps.

- Parents and relatives of your team members!
The Parents and Guardians

Do not forget about parents and guardians of your team members. Their cooperation and support are invaluable. As a coach, you can perform all of the planning tasks for your team, but sharing the workload will make your team more efficient, reduce stress, and increase team spirit among all the adults involved.

Parents and Guardians may be able to assist your team by:

- Serving as a mentor if they work in a technical or scientific field
- Planning and holding fundraisers
- Leading teambuilding activities
- Planning field trips
- Providing a place for your team to meet
- Making travel arrangements
- Or one of the most important tasks – planning refreshments so your team never runs out of fuel!

It is important to communicate regularly with the parents. This responsibility can be delegated to your assistant coach or a parent liaison. It is always a good idea to begin the season by meeting with your team’s parents in person. After that, find the communication method that works best for your team: regular in-person meetings, phone calls, email, or even a blog. Make sure all the parents understand FLL Core Values, Gracious Professionalism, and the limits on adult intervention.

TIP
You may want to hold a meeting for team parents at the start of the season to set expectations and recruit their help. It is a good idea to have parents review and agree to the FLL Coaches’ Promise to reinforce the goal that the children do all the work. Parents may want to help, but remind them they need to let the kids make decisions and do the work themselves.
TEAM DYNAMICS

Team Size

Teams must not exceed a maximum of ten members and we recommend a minimum team size of three members. There are advantages and disadvantages to any team size within this range. Some coaches believe small teams (five or fewer members) may concentrate better, work as a unit more easily, and provide team members with more opportunities for attention from the coach or mentors. Other coaches believe that larger teams have an advantage because they share the workload and can break into sub-teams to work on tasks. Regardless of your team size, the most important thing is to give your team the best experience possible with the resources you have.

Breaking larger teams into smaller workgroups works well with this age group as it encourages collaboration. One group can work with a coach or mentor on mechanics while others learn software or work on research. Some coaches believe rearranging members into sub-teams from meeting to meeting helps avoid cliques, build appreciation and understanding of all team roles between members, and bond the team.

SNAPSHOT

We had 22 children show up for the first FLL meeting. They all decided to register, and we now have three teams. As far as picking the best combination of children, sometimes your choice as a grownup will lead to a very flat team. Be sure to choose a team with a diverse range of skills, keeping in mind that children who are more challenging in the classroom will often shine on an FLL team because of the hands-on and self-directed nature of the activities.

Age Variations

Depending on the age and development of the team members, you may see two distinct developmental phases with mixed-age teams. Younger children often want to take apart and completely rebuild a robot...
that isn’t working, while older children will often want to stick with the current design and alter it. When working together, the two groups may frustrate each other. Neither method is right or wrong; the children are just at different developmental stages.

For team members 11 years of age and younger, you and the mentors may consider:

- Presenting problems or explanations visually or with hands-on examples
- Allowing team members time to understand the Robot Game and missions through manipulating and testing repeatedly

For team members older than 11, you and the mentors may want to:

- Create a structure that encourages crazier, out of the box ideas
- Provide older team members leadership opportunities, such as explaining ideas and next steps to the rest of the team

**Time Commitment**

Most FLL teams meet for about eight weeks after the Challenge is announced. They may meet for as little as one hour or hold multiple meetings up to ten hours a week. We suggest starting with two meetings per week that are two hours long, and adding or subtracting time as needed.

The time commitment will vary due to availability and experience as well as your team’s dynamics and goals. It is up to you and the team to decide what your meeting schedule should be. A rookie team typically needs to meet more often than a veteran team. A new team usually has a learning curve and may hold longer, more frequent meetings. In addition, some meetings will run like clockwork and others will be more challenging. You should plan to have some of each.

Create a realistic meeting schedule. Research when your first tournament will take place, and keep in mind how many

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**Tip**

If you are planning to attend an event or tournament, check the dates. Some occur as early as November and some are as late as March. The event date is your team’s deadline, so work backwards to figure out when each task must be completed.
weeks you have until then. Don’t forget to consider major holidays and school events. You can refer to the Week-by-Week Milestones schedule in Appendix B for an example of how a coach could plan a team’s eight week season.

As the coach, you may need additional time each week to prepare for team meetings. Spend this time coordinating help, maintaining equipment, communicating with your mentors, sponsoring organization(s) and parents, purchasing supplies, and registering for competition.

**ROLES & RESPONSIBILITIES**

**Child Safety**

As the coach, you and the other adults present are responsible for the safety of the children while they are in your care. Child safety is paramount to all of us involved with young people. Due to the age of FLL team members, the coaches, parents, and guardians are essential to team and child safety. Adults need to educate the team members and one another on how to recognize situations that may put a child at risk, and take measures to ensure that adults who work with their teams are reliable.

**The Team**

Discuss team member responsibilities with the whole team. It is important for you to be specific when talking about each individual’s role and responsibilities. Team members will usually have ideas about what they want to do, such as: programming, building, research, marketing, etc.; but be aware of the child who might be pushed out of doing what he really wants to do.

Have your team carefully consider how you want to divide responsibilities on the team. What would happen if someone had to leave the team or was sick on the day of the tournament? Would someone else be able to step in? Be sure to think through how this decision will affect the team as the season develops. If your team chooses to attend an event, all team members are expected to participate in the judging sessions and be present for the Robot Game matches.

Encourage team members to push the limits of their own comfort level and make sure everyone understands and does more than one
job. Rotate roles so everyone has an opportunity to try different things. Children often discover that they enjoy a task they wouldn’t have volunteered for on their own. This can also prevent boys and girls from falling into stereotypical gender roles. Remember: “We are a team.”

Here are examples of the roles or sub-teams you may want to establish within your team:

- **Researching** – Gather information about the Challenge theme, related real-world problems and existing solutions. Invite professionals to share their knowledge with the team.

- **Community Sharing** – Consider who in the community might be impacted by or interested in your team’s problem and arrange to share your findings with them.

- **Presenting** – Design a creative presentation to show the judges your team’s work on the Project.

- **Strategy Analysis** – Analyze the robot playing field and formulate various methods for accomplishing the missions. Lead the effort to establish a consensus on the final strategic plan and think about risks and rewards of different strategies.

- **Building** – Make decisions about building and work to form consensus on the mechanical design of the robot among team members.

- **Programming** – Make decisions about programming and form consensus on programming for the robot.

- **Project Management** – Get everyone focused, make sure everyone’s ideas are heard, find compromises, and keep everyone on schedule with a timeline.

- **Marketing** – Design and create the team logo, T-shirt, or banner. Write a press release and contact the local media to increase public awareness of the team and how the team benefits from the FLL experience. See the Media Attention section in Appendix B.

- **Documentation** – Record and document the entire team’s thoughts, actions, failures, and successes throughout the FLL season in a journal, scrapbook, storyboard, video, or other form you can display
at events. During the season, these records help the team organize information for decision making. At events and tournaments, these are an excellent way to showcase the team’s activities, teamwork, and spirit for judges and event attendees.

- Fundraising – Think of ways to raise money for team registration, materials and activities. Recruit parents and other children to help.

### Top Ten Tips for Rookie Teams

#### From FLL Team The Inventioneers, NH, USA

1. Remember, you don’t have to be an engineer to be a great FLL coach.

2. Work with team members to come up with rules for your team at the first meeting.

#### Examples:

- Respect others’ ideas
- Help others. If a team member is an expert in robot-building, she should be willing to help teach others this skill
- Identify ways to encourage one another.

- **Try this!** Our team listens for what they call Hard Rocks vs. Warm Fuzzies and point these out to each other during meetings to work on teamwork skills.

  - **Hard Rocks:** “That’ll never work. My idea is better.”
  
  - **Warm Fuzzies:** “Your idea gave me an idea. Let’s try your idea first, then we can try the other idea. Can I help you?”

- It’s everybody’s job to make sure the whole team participates.

- Make sure there is time during meetings for a snack and team games.

3. Let the kids and parents know that the kids do the work.
4. Practice asking questions to guide the kids to their own answers instead of telling them your ideas. Ask probing questions such as:

- What’s another way to do that?
- Everyone watch the robot this time – what do you see?
- How can you use sensors here?
- Where can you find more feedback to increase reliability?

5. Don’t try to go it alone:

- Contact veteran teams and coaches for support and ideas. The Inventioneers are committed to providing training, Project feedback, and guidance to new teams.
- Enlist parents as assistant coaches.
- Use websites like firstlegoleague.org and other Internet resources

6. Figure out your funding:

- Will you need to charge dues to cover startup costs?
- Can the parents’ employers provide funding for startup costs?

7. Get the team committed to a meeting schedule before the season starts. Members who can’t attend meetings make it hard for the whole team.

8. Make sure all parents have roles – even rotating ones (assistant coach, snack provider, fundraising lead, photographer) so that they become invested in the progress of your team.

9. Use good time management. Put tournaments on the calendar as soon as the dates are released. Keep the kids focused on how much time they have to accomplish tasks. This way, everything doesn’t pile up just before the tournament.

10. Keep it FUN!!! This is the most important tip for all teams, rookie and veteran. The kids will learn to handle frustrations and deadlines better if the element of fun is in the mix. Coaches and parents will be less tempted to “help” too much if there is an atmosphere that emphasizes the joy of learning and exploring new ideas.
FIRST® LEGO® League

COACHES’ HANDBOOK: Chapter 2