



Junior FIRST® LEGO® League

“...to create a world where science and technology are celebrated...where young people dream of becoming science and technology heroes...”

Dean Kamen, Founder, FIRST



Junior FIRST® LEGO® League

Coaches' Manual

| www.usfirst.org | www.jrfirstlegoleague.org |

Jr.FLL is the result of an exciting alliance between FIRST and the LEGO Group.



FIRST® is a registered trademark of the United States Foundation for Inspiration and Recognition of Science and Technology (FIRST). LEGO® is a registered trademark of the LEGO Group. Junior FIRST® LEGO® League and Jr.FLL®, are jointly held trademarks of FIRST and the LEGO Group.

©2013 FIRST and the LEGO Group. All rights reserved. Official Junior FIRST® LEGO® League (Jr.FLL) Teams and FIRST® LEGO® League (FLL) Operational Partners are permitted to make reproductions for immediate team and Operational Partner use only. Any use, reproduction, or duplication for purposes other than directly by the immediate Jr.FLL team as part of its Jr.FLL participation is strictly prohibited without specific written permission from FIRST and the LEGO Group.

Table of Contents

About FIRST	1
About LEGO Education	2
About Junior FIRST LEGO League	4
Jr.FLL Coaching Basics	6
Additional Support for Coaches	11
Building Your Team	15
Using the Jr.FLL Team Meeting Guide	18
Customizing the Jr.FLL Experience	20
A Final Note to Coaches	23

About FIRST

FIRST (For Inspiration and Recognition of Science and Technology) was founded by inventor Dean Kamen to inspire young people's interest and participation in science and technology. Based in Manchester, New Hampshire, USA, FIRST is a 501 (c) 3 not-for-profit public charity.

FIRST is a volunteer-driven organization built on partnerships with individuals, as well as businesses, educational institutions, and government. Some of the world's most respected companies provide funding, mentorship time and talent, volunteerism, equipment, and more to make FIRST a reality. As a team coach, you join over 60,000 committed and effective volunteers who are key to introducing over 130,000 youth to the joy of problem solving through engineering.

FIRST offers several programs to inspire and encourage youth:

- FIRST Robotics Competition (FRC®) for 14- to 18-year-old students
- FIRST Tech Challenge (FTC®) for 14- to 18-year-old students
- FIRST LEGO League (FLL®) for 9- to 14-year-old students
- Junior FIRST LEGO League (Jr.FLL) for 6- to 9-year-old students

FIRST also operates a research and development facility, FIRST Place, at its Manchester, New Hampshire, USA, headquarters.

Since 1992, FRC has challenged 14- to 18-year-old students working with professional mentors to solve an engineering design problem in an intense and competitive way. The program is life-changing, career-molding, and a lot of fun. FTC is an intermediate robotics competition that offers students the traditional challenge of FRC, but with a more accessible and affordable robotics kit.

In 1998, FIRST Founder Dean Kamen and the LEGO Group's Kjeld Kirk Kristiansen joined forces to create FLL, a powerful program that engages younger children in playful yet meaningful learning while helping them to discover the fun in science and technology through the FIRST experience. Since 1998, over 50 countries have hosted FLL tournaments. In 2004, FIRST saw a need for a program directed towards younger children. Jr.FLL is that program. Engaging children on the same themes as FLL, Jr.FLL is geared towards children ages 6-9 years.



education

About LEGO Education

Learning is at the very core of the LEGO Group's most heartfelt values, and the company has invested many years of cooperation and research with educators and child development specialists to build a rich understanding of what it takes to provide effective learning experiences.

While exam scores may continue to dominate agendas, research shows that greater educational benefits are achieved by focusing on applying knowledge as a means to expand learning rather than on acquiring knowledge in order to pass examinations. Therefore, the role of educators is changing.

LEGO Education offers unique solutions to parents and teachers who want to bring more innovation and creativity into their students' and children's learning environments. Using LEGO Education's tools and hands-on teaching methods, the students will be better able to learn through experiences, collaborate with their classmates, and think creatively to come up with unique solutions. That's LEGO smart. To read more please visit our Web site at LEGOeducation.us.

LEGO Education Jr.FLL Base Kit (Only Available in North America)

- The Jr.FLL Base Kit is designed for teams who are starting out in Jr.FLL.
- It contains all of the basic parts and essential elements needed to build a wide variety of models.
- The sessions in the Jr.FLL Team Meeting Guide have been designed with the Jr.FLL Base-Kit in mind as it is the LEGO product most teams will be using, but that does not mean it is strictly required.
- While the Jr.FLL Base Kit is the best and easiest way to ensure your team has all the LEGO elements they require, if your team is not able to acquire a Jr.FLL Base-Kit, the Challenge for the season can be completed with a different assortment of LEGO elements, and a little imagination on the part of the team members.

For more information on the Jr.FLL Base Kit and other LEGO Education products designed to aid Jr.FLL teams, please go to www.usfirst.org/jrfll or www.legoeducation.us, or refer to the *Links* section on page 22 of this manual.

Using LEGO BuildToExpress for Education Mini-Kits (Only Available in North America)

Included in the Jr.FLL Base Kit are six LEGO BuildToExpress for Education mini-kits containing a selection of LEGO elements that team members can use to express their thoughts and ideas.

As with all LEGO Education BuildToExpress activities, each team member will be asked to build a model that expresses his or her response to a Building Challenge. Anytime BuildToExpress is used the Building Challenge will be clearly identified. When the models have been built, team members will be asked to share their ideas, one student at a time, by talking about their builds within their groups.

When facilitating a BuildToExpress session, it is important to allow team members to communicate their ideas on their own. Coaches should make no assumptions about what each element represents on a team member's model. Ask facilitating questions of the team members to encourage them to explain what they have built.

Ask open-ended questions like the following to encourage team members to share as much as possible:

- What does your model mean?
- What is most important about your model?
- How does the element/color/placement help explain your idea?
- What would someone else notice about your model?
- What would you like someone to ask about your model?



About Junior FIRST LEGO League

What is Jr.FLL?

Junior FIRST LEGO League is a hands-on program designed to capture young children's curiosity and direct it towards discovering how science and technology impact the world around them. The program features a real-world challenge to be explored through research, critical thinking, and imagination. Jr.FLL is for children aged six to nine years old and involves learning and demonstrating knowledge in a fun way.

What are the Goals of Jr.FLL?

The goal of the Jr.FLL is to create a non-competitive learning environment for teams of children aged six to nine years old. This will help students work together to learn about, demonstrate, and share knowledge they have discovered about a Challenge topic.

On average, teams meet once or twice a week throughout a 6-8 week season. Students will become familiar with the Challenge, and choose a topic to research which pertains to the task at hand. The depth and scope of each year's topic can be challenging for students and coaches, but the Challenge document and the Jr.FLL Team Meeting Guide offer suggestions and activities that will help teams to successfully meet the Challenge and complete their season.

What is the Challenge?

Every year, Junior FIRST LEGO League works with experts in the field to create a Challenge that relates to an important real world issue.

The Challenge will take students through a process of acquiring new knowledge about the Challenge topic and demonstrating that knowledge in two ways:

1. Creating a model which includes a motorized part and a simple machine.
2. Creating a *Show Me* poster that shows the team's research and gives information about their team and model.

What are the Rules?

You may obtain the materials from any source, so long as they meet the minimum requirements. You can access ordering information for the optional Jr.FLL Base Kit (Only Available in North America) from your registration log-in.

- The model must be no bigger than 15-inches x 15-inches—a LEGO baseplate or other pre-measured footprint makes it easier to keep the model the right size.
- The model should be made of LEGO parts—your team can use any LEGO bricks, figures, or any moving parts they need. Typically a team of six will use 400 to 1,000 LEGO parts during the season.
- The model must have at least one motorized part—your team can use a motor like the one available in the optional Jr.FLL Base Kit, or it can be programmed to move using a LEGO WeDo™ set and software.
- The model should include one simple machine—your team must design and build it using LEGO elements; you can find many pieces useful for building a simple machine in the optional Jr.FLL Base Kit.
- Your team cannot paint or decorate the LEGO parts; they cannot use other art or craft materials in the model.
- Create the *Show Me* poster using a 22-inch x 28-inch flat poster board or a 36-inch x 48-inch tri-fold presentation board—no bigger!
- Your team can use words, drawings, photos, and small objects attached to the poster to tell about what they learned.
- Your *Show Me* poster should:
 - Tell about your team—your team name, your team members (remember to make space to share something special about each person), and you...the coach.
 - Tell about the places your team hunted for answers, the people they asked.
 - Tell about your answer to the Challenge, and how your team chose to represent this.
 - Tell about the LEGO model and machine your team created—what is moving, why, and how.

Piracy and Non-registered Teams

In order for Jr.FLL to be able to continue to offer full support to coaches through Challenge documents and other resources, it is important that all teams are registered through FIRST. FIRST is a non-profit organization, and as such any fees collected go to administering and supporting our programs. We kindly ask that all Jr.FLL teams register online and that you do not copy, distribute, or post online any materials given to your registered team. This will help ensure that Jr.FLL and the entire FIRST family of programs are able to continue to inspire young people for years to come.



Jr.FLL Coaching Basics

Coaching a Jr.FLL team can be one of the most rewarding experiences of your life. Like any great reward, coaching involves a commitment of time and energy. But remember, the kids on your team really need you to give them guidance and provide structure, encouragement, and most of all, a fun experience. To succeed, the coach, team members, mentors, and parents must commit to the entire Challenge: researching, modeling, creating the *Show Me* poster, and working together as a team for the entire 6- to 8-week season.

The Jr.FLL program differs from other *FIRST* programs; it is not a competition. The program focuses on allowing children to learn, collaborate, and have fun. Each team requires at least one adult coach. (The coach must be at least 18 years of age or older.) Good coaches come from many walks of life and have included teachers, parents, engineers, scientists, college students, and scout leaders. Coaching requires no special skill—just patience, dedication, and a willingness to learn alongside the team. As a coach, you will direct the learning process, allowing the children to solve the Challenge without providing the solution yourself. Coaches' Resources can help rookie and veteran coaches alike get their teams started.

Responsibilities of a Coach

As a coach, you also are responsible for honoring and communicating Jr.FLL Core Values to team members, team volunteers, and others affiliated with your team. All Jr.FLL teams are expected to abide by Jr.FLL rules and guidelines, as they exist now and as they may be set forth during the season. (More information about team rules, guidelines, policies, and procedures is provided later in this guide.) Any updates will be communicated to Jr.FLL coaches by email. Be sure to read the *Coach's Promise*, *Jr.FLL Core Values*, and *Gracious Professionalism™* information that follows so that you fully understand Jr.FLL and these responsibilities.

Coach's Promise

1. The kids come first. Jr.FLL is about the kids having fun and becoming excited about science and technology. Everything my team does starts and ends with that principle.
2. The kids do the work. This is their opportunity to learn and grow. The kids on my team do all of the research, problem solving, and building. Adults can help them find the answers, but we do not give them the answers or make the decisions.
3. My team is comprised of six or fewer members, all team members participate on only one official registered Jr.FLL team, and all team members are no older than nine on January 1 of the year the Jr.FLL Challenge was released.
4. I am responsible for reading and relaying all aspects of Jr.FLL guidelines and rules to my team, other coaches, volunteers, and parents. (Jr.FLL will communicate with your team using the primary email address you provided.)
5. I will encourage my team members, other coaches, volunteers, and team supporters to develop and practice a set of Jr.FLL Values that reflect FIRST's goal to change culture in a positive way by inspiring others through our team's actions and words.

Guidelines for Coaching

There are as many ways to coach a Jr.FLL team as there are teams. Jr.FLL encourages fresh thinking.

Let your team celebrate its own style. Do what makes sense for you and the young people you are working with. With that said, here are some guidelines to consider.

- In Jr.FLL, kids make all critical decisions in the building and project development processes. If you find yourself pushing a direction, you are doing your team a disservice. Remember, you want your team to think for themselves and you don't want to suppress any revolutionary ideas.
- A mutual foundation of trust and respect is critical for a supportive learning environment. Everyone's voice must be heard, and all ideas should be listened to with a patient and open mind.
- Encourage your team to experiment; allow them to explore options.
- As much as you might enjoy building, remember that the kids on the team must design and build the model—not you or any other adult.
- When a coach or mentor does the work, it sends the kids a strong message—you are not capable.

Does this mean you should stand idly by while your team struggles with the Challenge? Absolutely not!

Facilitating Learning

You must be involved, but your role is to mentor and encourage the young ones to do the thinking. Instead of directing your team to “add a pulley here using rubber bands and a wheel,” ask questions. Present options (ranging from practical to the wildly absurd) to start the brainstorming process—allow your team to find the solution. One useful method is to reply to a question with another carefully considered question that encourages team members to use their knowledge of science and hypothesize logical outcomes:

- What would happen if . . .
- And then . . .
- How will that work?

Coaches differ in the amount of instruction they give their teams. Some give very little; others give much more. A successful Jr.FLL coach controls the process, not the content. Coaches facilitate, help the team complete its work, and improve the way it works together.

Kids become problem solvers by solving problems themselves! We understand that adults can be just as passionate about Jr.FLL as kids, but adults must always remember: **THE KIDS COME FIRST.**

Jr.FLL Core Values

Jr.FLL is a child-centered program which aims to give kids a unique and stimulating experience. FIRST encourages young people to learn the value of teamwork and to respect everyone’s ideas and contributions to the team. Jr.FLL values are about appreciating our differences and learning what those differences add to our lives. Jr.FLL succeeds most fully when team members bring these values back to their communities.

We ask that everyone associated with every Jr.FLL team understand and honor these Core Values.

- We are a team.
- We do the work. Our coaches and mentors help us learn, but we find the answers ourselves.
- We share our experiences and discoveries with others.
- We are helpful, kind, and show respect when we work, play, and share. We call this Gracious Professionalism.
- We are all winners.
- We have fun.



Supportive, Noncompetitive, Learning Environment

Jr.FLL is intended as a program that creates a supportive, noncompetitive, learning environment where children drive the team's goals and plans, children do the work, and adults mentor and facilitate teamwork.

■ Trust and Respect

A mutual foundation of trust and respect is critical for a supportive learning environment. Everyone's voice must be heard, and all ideas should be listened to with a patient and open mind. Part of your role is to listen to team members and keep lines of communication open. While you may not be able to use every idea or suggestion, hear each child out. Clear expression of an idea and convincing others is a great learning experience. Be sure the youngsters understand the concept: "No idea is a bad idea."

■ Child-Driven Processes

Once the Challenge is unveiled, the children will often drive the goals of the team. This is perfectly acceptable and gives you a chance to step back and watch their progress.

Encourage the kids to brainstorm; it's an important part of a team's planning process. It brings out creative ideas and produces better-thought-out solutions. When you lead discussions or make suggestions, give choices to the team members. Coaches should continue to facilitate the process the team follows to reach its goal, but allow choices within that process. One way to do this is to offer options to the team where every outcome is acceptable. That way, there will be no wrong answers. As coach, you then help the team reach consensus in a fair way. There are many paths to success.

■ Keep It Simple, Silly

Introduce KISS (Keep It Simple, Silly) to your team. As your team learns to work together on this season's Challenge, they will face many issues, large and small. In the engineering world, simple solutions are much more desirable than complex ones. A complex solution has many more places to fail, is more difficult to repair, usually costs more, and usually is more difficult to operate.

Do all high-tech devices fail the KISS test? Of course not! Think about microwave popcorn. It employs much more technology than placing kernels and oil in a pan, but it's much simpler (and safer) to make and clean up.

Even the youngest teams are sometimes drawn to complex solutions. Keep reinforcing the KISS principle. Ask questions that help your team to distill their ideas and make their Challenge and model building work as simple as possible.

■ Facilitating Teamwork

Be aware of verbal and non-verbal cues and interpret the conversation to help the teamwork through communication difficulties. If you validate team members' feelings, they are more likely to discuss problems. Sometimes acknowledgement or positive feedback may be all the response a team member needs. A great way to work with a child who needs this feedback is to find one great point in their plan and point this out to the rest of the team. This validates their idea, but also allows you to move away from ideas that are not relevant to the topic.

A frustrated child might cross his arms over his chest and refuse to face his teammates. It is your job to help this child re-join the team. Keep in mind that we all deal with stress differently. One child might feel the need to walk away to reclaim personal space and another might attack the conflict head on. Be prepared to have some activities for children who may need a break from group work. This could include some research on the computer, or puzzles, games, or pictures related to the Challenge.

Gracious Professionalism™

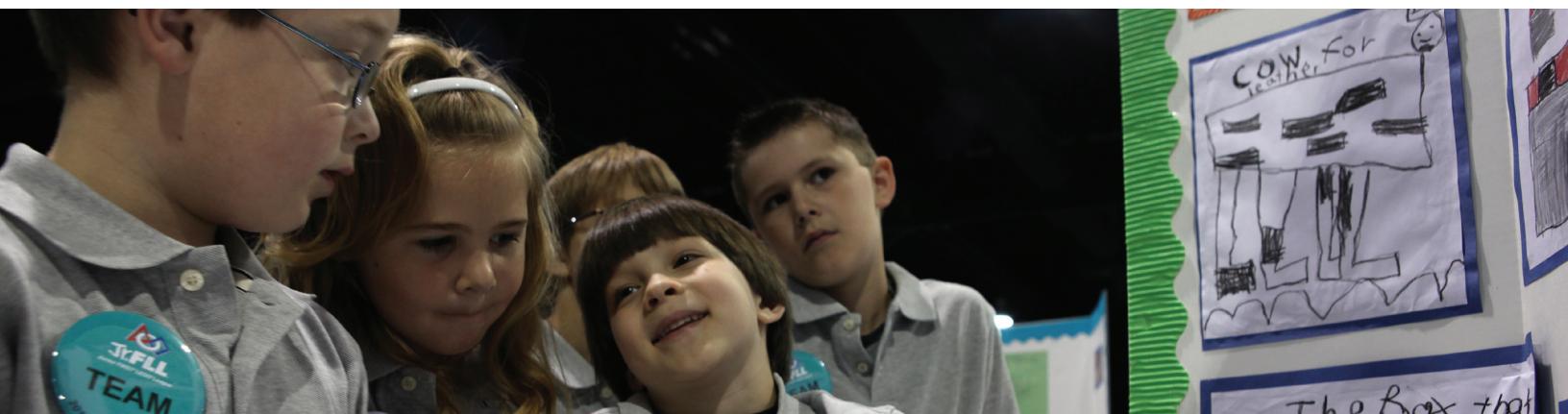
Dr. Woodie Flowers, National Advisor for FIRST, speaks about Gracious Professionalism in this way.

The FIRST spirit encourages doing high-quality, well-informed work in a manner that leaves everyone feeling valued. Gracious Professionalism seems to be a good descriptor for part of the ethos of FIRST. It is part of what makes FIRST different and wonderful. Gracious professionalism can and should mean different things to each of us. It is possible however, to outline some of its meanings:

- Gracious attitudes and behaviors are win-win.
- Gracious folks respect others and let that respect show in their actions.
- Gracious professionals make a valued contribution in a manner pleasing to others and to themselves as they possess special knowledge and are trusted by society to use that knowledge responsibly.

In the long run, Gracious Professionalism is part of pursuing a meaningful life. One can add to society and enjoy the satisfaction of knowing that you have acted with integrity and sensitivity.

That's good stuff!



Additional Support for Coaches

The job of a coach is an important one. Your Jr.FLL team could not exist or succeed without your help and guidance. To make your role as coach easier, FIRST and LEGO Education offer a variety of resources to help equip you with all of the knowledge and guidance you need to lead your team to success.

Challenge Document (Updated Annually)

The Challenge document is the center of your team's season. Each year, a new Challenge, based around a new topic, is released to teams in the form of the Challenge document. This document includes a brief overview of that year's topic, as well as a breakdown of the four phases that a team will work through when preparing themselves for a Jr.FLL Expo.

These phases are:

■ Think About It

Get the team to begin thinking about the Challenge topic.

■ Learn About It

Get the team to learn more about the Challenge topic, and helps them begin to understand some of the smaller parts that make up this topic.

■ Build It

Gets the team to demonstrate something they learned about the Challenge topic by using LEGO elements to build a model that includes at least one motorized part.

■ Share It

Gets the team to create a poster that shows what they have learned about the Challenge topic. Teams will develop a short presentation that explains their new found knowledge and their LEGO model. They can share what they've learned through a Jr.FLL Expo, Online Showcase, or another type of showcase. Your team can give a presentation or answer questions from Reviewers or spectators.

Coaches Resources (Updated Annually)

Part of Jr.FLL coaching involves guiding students as they learn about the Challenge topic. In order to help facilitate this process, Jr.FLL Coaches are provided with a document of full of resources including discussion topics, online resources, print resources, and a topic-specific glossary of terms.

Online Showcase

As part of the Jr.FLL Challenge, teams are asked to share with others what they have learned during the season. Many teams do this by attending a local Jr.FLL Expo, but, due to the location of some teams they don't have this opportunity. With the Jr.FLL Online Showcase all teams can share what they've learned and have a virtual Jr.FLL Expo experience! Registered Jr.FLL teams can create team profiles as part of their season.



Jr.FLL Team Meeting Guide

The Jr.FLL Team Meeting Guide consists of 12 main session activities and 4 optional “drop-in” activities that will allow coaches to guide their teams through a successful season. For more information on the Jr.FLL Team Meeting Guide, see the “Using the Jr.FLL Team Meeting Guide” section of the Coaches’ Manual.



LEGO Education Jr.FLL Guide to Building and More (North America Only)

Included with the Jr.FLL Base Kit is the Jr.FLL Guide to Building and More. This guide is full of ideas and suggestions to help team members master the building and mechanical skills they will need during the “Build It” phase of the Challenge.

The Guide to Building and More includes two lessons that can be used to teach simple machines to your team, as well as build instructions for three motor-powered LEGO models that will help demonstrate important mechanical concepts to your team in a fun and engaging way.



LEGO Education Jr.FLL Coach's Guide to BuildToExpress (North America Only)

Included in the Jr.FLL Guide to Building and More is the Jr.FLL Coach’s Guide to BuildToExpress. BuildToExpress is a communication tool developed by LEGO Education that helps learners of all ages to express their ideas in concrete ways.

BuildToExpress builds on the same Core Values as Jr.FLL and is a great way to get team members to clearly identify and vocalize their ideas.

Optional LEGO Education Jr.FLL Base Kit (North America Only)



LEGO Education offers an optional Jr.FLL Base Kit that includes a variety of LEGO sets and pieces that will help your team build a Jr.FLL model. The kit provided for Jr.FLL has many parts that have the potential for motion: a motor, a power supply, gears, chains, wheels, axles and much more. We hope teams will be inspired to use these parts to their fullest potential, but remember, your team only needs to create one motorized part. Jr.FLL is a terrific opportunity to learn about simple machines. This kit is suggested for teams that are just beginning their Jr.FLL journey or teams that have no materials to start with. Ordering information is available from your registration log-in.

Optional LEGO Education Jr.FLL Robotics Kit (North America Only)



This season, an optional Jr.FLL Robotics Kit is also available for purchase from LEGO Education. The kit includes a LEGO WeDo™ set, WeDo software, and the WeDo Activity Pack. This kit provides teams with the opportunity to explore simple programming techniques and gain experience in building models that are moveable using computer software. The Jr.FLL Robotics Kit is suggested for teams that are returning for their second year and would like to gain more experience or for teams of older children (ages 8- to 9-years) who are preparing to move to the FLL Program. Ordering information is available from your registration log-in.

It is important to note that teams who purchase this kit receive a team site license for the software and activity pack. These may be downloaded to team computers only—nowhere else. This is a special license available only for Jr.FLL teams and only with the purchase of a Jr.FLL Robotics Kit. Team site licenses are not otherwise available from LEGO Education. We thank-you in advance for adhering to the provisions of the team site license.

Other LEGO Education Jr.FLL Product Options (North America Only)

LEGO Education also offers a variety of additional kits and parts to help teams create and integrate motorized parts into their models. Additional information can be found on the Jr.FLL pages of the *FIRST* website.





Building Your Team

A Jr.FLL team consists of up to six members (ages 6- to 9-years) and at least one adult coach/mentor.

Kids come to the team from many different avenues: schools, after-school programs, home-schooling groups, Girl Scouts, Boy Scouts, Girls Inc., Boys & Girls Clubs, YWCA, YMCA, Big Brothers-Big Sisters, religious groups, and neighborhood groups.

Encourage mentorship from FLL, FTC, and FRC team members; family members; practicing professionals; and school or community volunteers who support the Jr.FLL team. Their cooperation and support are invaluable. They can help with fundraising, logistics, team building, mentoring, or opening their homes for a team meeting and sharing their experience. Each volunteer has something to contribute. Perhaps a parent could coordinate the materials and resources the team needs throughout the season. A local engineer might find how-to guides and expert resources on the Jr.FLL Challenge topic for your team or help with brainstorming. An older sibling might help with team-building activities.

Additionally, some parents may be interested in helping to coordinate a Jr.FLL Expo for their team and possibly invite local teams to participate.

The Team

Discuss responsibilities with the whole team. It is important for you to be specific when talking about each individual's role and responsibilities. Team members usually have ideas about what they want to do—building, research, making the *Show Me* poster, presenting—but be aware, some children can be pushed out of trying something they really want to do by other more verbal and enthusiastic team members. Also, be mindful of those who avoid certain tasks. Remind the children often of the importance of collaboration and teamwork. Rotate roles so everyone has an opportunity to try different things.

Building Your Season

In addition to planning and scheduling meetings, visits, and trips, we suggest that you prepare for the season by:

- Reading the season's Challenge document
- Reviewing the Coaches' Resources
- Preparing some team building exercises and break time activities

You can find the Season materials by logging into your registration account and checking the Jr.FLL Team Summary page.

Setting a Schedule

Developing a schedule can be challenging for new coaches, but a well regulated schedule with clear milestones will play a large role in your team's success.

Things to consider:

■ Existing Schedule

The Lesson Planning Routes laid out in the Jr.FLL Team Meeting Guide is one model for planning a season that may work well for your team.

■ Number of Meetings per Week

Teams generally meet once or twice a week. This will be decided by the availability of the team members and the coach. Some teams start the season meeting weekly, and then increase to twice weekly as the time gets closer to their Jr.FLL Expo.

■ Team Size

Many hands make light work, but a larger team can be more difficult to manage for a coach. Sometimes a smaller team can get more accomplished than a larger team, in fewer practices. There should be no more than six children on a Jr.FLL team.

■ Goals

Setting goals and milestones for your team is a good way to keep them on-task and working toward a successful season. Work with your team members to set goals that are:

- Specific
- Measurable
- Attainable
- Relevant
- Timely

Setting "smart" goals for your team will help keep them on the path to success.

Attending a Jr.FLL Expo

Jr.FLL Expos vary from region to region. Jr.FLL Expos showcase and celebrate your team's accomplishments. They are not competitions. Expect a Jr.FLL Expo to last approximately two to four hours.

Teams attending a Jr.FLL Expo bring their model and *Show Me* poster. Volunteer Reviewers visit with each team, check out the models, and ask questions. The process is not meant to overwhelm the children. Reviewers realize the process can be stressful for some kids. Remind your team that the Reviewers are looking forward to learning from them!

Coaches should make sure that all of the team members are able to attend any Jr.FLL Expo in which the team will be participating. This might mean organizing rides or carpools. They should also ensure that the team's model and *Show Me* poster arrive safely at the Jr.FLL Expo's location. Coaches may also wish to bring things like water, healthy snacks, and a camera, to help make sure that the team has everything they need to enjoy their experience.

Your team will enjoy seeing what other teams have designed and built. This is a great way for kids to learn from each other. You may want to think of ideas to encourage this process of learning from other teams. At the end of the Jr.FLL Expo, all teams receive recognition for their efforts at the Hi Fives ceremony.

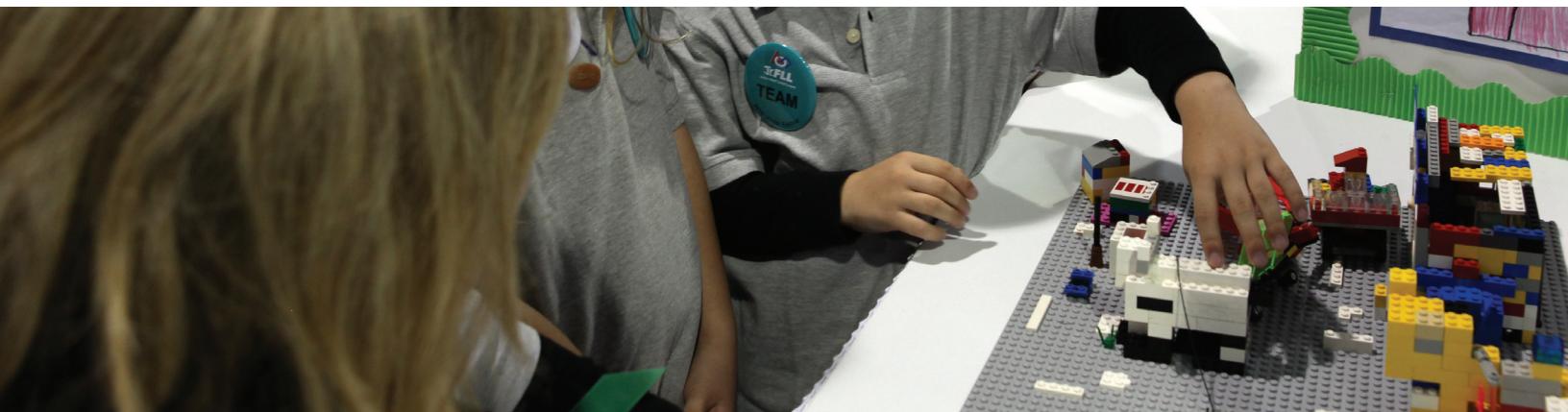
Team registration does not include a guarantee that a Jr.FLL Expo will be available in your area.

For more information on a Jr.FLL Expo near you, please visit:

<http://www.usfirst.org/roboticsprograms/jrfll/events>

Teams that are unable to attend a Jr.FLL Expo can visit the Online Showcase to share their research, model and *Show Me* poster with other teams from around the world. Teams can also display their models at a local school, PTA night, library, or community center.





Using the Jr.FLL Team Meeting Guide

What is the Jr.FLL Team Meeting Guide?

The Jr.FLL Team Meeting Guide is a series of ready-made activities that you can complete with your team members. There are four Main Focus Areas covered in the Jr.FLL Team Meeting Guide that correspond to major sections of the Challenge document. Each of these Focus Areas is broken into two to four sessions with activities to help your team move through the phases of the Jr.FLL Challenge.

Additional Drop-In Sessions have been included to help team members to further develop and improve skills that are critical to the Jr.FLL process. Each session is 1 to 1.5 hours long.

Focus Area Sessions

■ Focus Area 1: Think About It!

2 Sessions: Teams will begin exploring the Challenge topic and setting up the team for the season.

■ Focus Area 2: Learn About It!

4 Sessions: Teams will identify which area of the Challenge topic they will study, discuss and conduct research, learn from a real-world source, and share what they have learned.

■ Focus Area 3: Build It!

4 Sessions: Teams will learn about the Engineering Design Process, review simple machines, then they will design, build, test and review their team's model.

■ Focus Area 4: Share It!

2 Sessions: Teams will create a *Show Me* poster and prepare and practice their presentation for a Jr.FLL Expo.

Drop-In Sessions

■ Session A: Team Building

1 Session: Teams will develop stronger team cohesion through fun and interactive games.

■ Session B: Simple Machines

1 Session: Teams will develop a better understanding of mechanical movement through an exploration of simple machines.

■ Session C: Building Challenge

1 Session: Teams will develop building and design skills through a fun and creative design challenge.

■ Session D: Follow-Up

1 Session: Teams will celebrate success and reflect on the Jr.FLL season while continuing theme-based learning.

Session Planning

The Jr.FLL Team Meeting Guide is set up in such a way that a coach can use as many or as few of the activities as they wish. Using the Focus Area Sessions will take your team through the basics of a Jr.FLL Challenge by having them think about the Challenge topic, learn about the Challenge topic, build a model, and prepare a poster and presentation.

The four Drop-In Sessions will help to make your team's Jr.FLL season richer, by encouraging team building, exploring simple machines, further investigating the design process, and encouraging reflection on the Jr.FLL experience.

There are several different routes that can be taken. Refer to the *Jr.FLL Season Session Flow* in the Jr.FLL Team Meeting Guide for further suggestions on the order in which sessions can be implemented.

■ Experienced Teams

Experienced teams, or teams who have previously completed successful Jr.FLL seasons, may already have the basic skills that are required of a Jr.FLL team. While things like team building and reflecting on the season's success are still important, teams of older children with previous Jr.FLL experience may not require all of the Drop-In Sessions.

■ New Teams

Conversely, for teams of young children, or teams that have not participated in Jr.FLL before, the Drop-In Sessions can be tremendously helpful. The Drop-In Sessions will ensure that younger or newer teams have all the skills necessary to complete the Challenge while avoiding common pit-falls.

■ Extending to FLL

Teams that will be moving from the Junior FIRST LEGO League to the more senior FIRST LEGO League in the near future are encouraged to re-familiarize themselves with simple machines, and the design process, as they will be a key component of success at the FLL level. Using Drop-In Sessions B and C (Simple Machines and the Building Challenge) will help reinforce skills that the team has developed during their time participating in Jr.FLL and prepare them for the more advanced FLL program.



Customizing the Jr.FLL Experience

There are many different approaches that a coach can take when planning their team's Jr.FLL season. Several factors will impact the approach you take with your team including:

Time Constraints

Sometimes, for a variety of reason, teams are not able to take the full 6-8 weeks recommended for their season. This does not mean that they are not able to participate in Jr.FLL, but it does mean that the approach the coach takes will be slightly different.

If your team is under a time constraint, try following the Main Focus Area Sessions only, from the Jr.FLL Team Meeting Guide. This will make sure that the basics needed for a season are covered.

Working with Different Sized Teams

Different sizes of teams present different challenges. Jr.FLL recommends that a team be between four and six members, but some teams will have more members and some teams will have fewer. Below are some suggestions for working with different sizes of teams:

■ Working with Smaller Teams (2-4 members)

- Because there are not as many team members to share the workload, consider breaking each team meeting into two smaller sessions to allow team members more time with each portion.
- Some activities that are suggested for small groups may need to done in pairs, or individually.

■ Working with Larger Teams (4-6 members)

- Larger groups can be more difficult for coaches to manage. Make sure that all team members are assigned a specific task when the team is working. Consider assigning roles such as builder, presenter, recorder, researcher, etc. This may mean changing individual activities into group-based activities.
- Frequent check-ins with the coach can help to keep group members on-task.

- Make sure that each student gets a chance to use LEGO elements when building the team's model. This may mean that building will be done in two shifts.

Differentiated Instruction

Below are some suggestions for accommodations for team members who need additional support, or an extra challenge:

■ Providing Additional Support:

- Support students during the Learn About It phase of the Challenge by guiding their research and suggesting material.
- Make sure to use age- and reading level- appropriate research materials with your team.
- Allow more time for building.
- Keep team members focused by asking them to describe what they are building as they are making it with a partner.
- To help steer team members' conversation and brainstorming towards session objectives, refer to the Coaches' Resources document for additional resources.

■ Providing an Extra Challenge:

- Add additional time-constraints to building activities to make them more challenging for team members.
- Add additional BuildToExpress challenges. Refer to the BuildToExpress for Jr.FLL document for Building Challenge suggestions.
- Encourage team members to reflect on and document what they have accomplished in each session. Ask team members to make a drawing or painting to show what they have learned.
- Encourage team members to research the Challenge topic independently, both online, and at the library.

■ Team Member Profiles:

The descriptions below are generalizations and may not apply to all team members at these grade levels. They have been provided in order to give coaches a general understanding of the kinds of support and encouragement teams with mixed ages may need. Suggestions to accommodate younger or older team members have been provided throughout the team meeting guide.

- Team members in **Kindergarten (5-6 years old)** are generally enthusiastic and energetic. They will often be very eager to help and participate, but may need a little extra support to stay on task and to work as a team. Team members at this level are often still learning to express their ideas clearly and to take turns when speaking or working with material. They will typically have very limited reading or writing skills and some may need a little help with fine motor skills, such as cutting with scissors. It's a good idea to provide them with lots of pictures or videos, to read important information aloud together, and to talk about ideas as a group (e.g., sitting in a circle). Having local experts come in to share their experience in person is a great way to conduct research with this age group. A 10 to 15 minute interview is

appropriate for team members of this age. They may need to change tasks more often than older team members, so it's helpful to plan team meeting time with several small activities or quick breaks to help them stay engaged.

- Team members in the **1st Grade (6 to 7 years old)** generally have a little more experience with routine and day to day procedures, such as raising their hands to speak, waiting for one's turn at a center, or cleaning up material at the end of the day. Like their younger teammates, team members of this age will benefit from a team meeting structure that includes several shorter activities with frequent breaks or changes in the task on which they're working. They are beginning to read and write simple text and often have a little more control with fine motor skills. They will likely still need help from an adult or older student to record their ideas. They can also draw pictures and describe them or add key words or short sentences. They can often express themselves with support to answer questions, but still benefit from talking through ideas and research as a group. Showing pictures, kid friendly magazines, or videos will be of great benefit to these team members
- Team members in the **2nd Grade (7 to 8 years old)** are usually very comfortable with routine and daily procedures. They are becoming more independent readers and writers and can often recount and describe details from text that's been read aloud or other media. They may be able to do some independent research from simple text or videos. These team members will still benefit from talking ideas through as a group, and using pictures or having an adult (or older student) help them record their ideas.
- Team members in the **3rd Grade (8 to 9 years old)** can usually read and write about known subjects with some confidence and are comfortable following clear directions. They are often able to speak in detail about their own ideas and things they have learned through reading or other sources. Most team members in 3rd grade will be able to record their own ideas, but will also benefit from discussion in pairs or groups.

Resource Constraints

A lack of resources can be challenging for a team. The Jr.FLL Base Kit from LEGO Education is an affordable solution that provides all of the LEGO elements and motors required for a team's model. If this is not an option, LEGO elements from other kits is an acceptable solution. While the LEGO Education Jr.FLL Base Kit is the ideal solution, the team members' success should not be hindered if this is not available; use whatever LEGO elements you can find for your team.

Links

- LEGO Education website:
<http://www.legoeducation.us>
- List of Jr.FLL Products available from LEGO Education:
http://usfirst.org/sites/default/files/uploadedFiles/Robotics_Programs/JrFLL/JrFLL%202013%20Kits%20Price%20List%20updates%201.20.14.pdf
- Junior *FIRST* LEGO League website:
<http://www.usfirst.org/jr.fll>
- Find a Jr.FLL Expo:
<http://www.usfirst.org/roboticsprograms/jr.fll/events>
- Visit the Jr.FLL Online Showcase:
<http://jrfllshowcase.usfirst.org/>



A Final Note to Coaches

1. Don't take your job too seriously! We want you and everyone on the team to enjoy the experience. Our goal is for you to help your kids have fun building and learning something about a real-world problem.

Team members win just by participating.

2. At the end of the Jr.FLL season, your team should be proud of its accomplishments. Your team members explored a subject through building and research, designed and built a model, and learned how to work together successfully. It's important to celebrate what you've done together. Many teams celebrate at Jr.FLL Expos; others celebrate in their own way. Do what works best for your team, but be sure to include a plan for celebration in your schedule. Your celebration can be something as simple as an ice cream party or a trip to the park as a team.

Whether your team attends a Jr.FLL Expo or not, be sure to make some one-on-one time for each team member. Tell each one how they contributed to the team. Remind each member of the great ideas they had, the problems they solved, the way they supported teammates, and the things they learned during the season. This is your most important job as a coach, so take time and be thoughtful about what you say to each child. It is a great idea to provide each team member with a small token to remember the experience. Young children love to receive small, tangible items in recognition of their accomplishments.

– Check out the Jr.FLL Awards at <http://usfirst.org/roboticsprograms/jr.fll/events> for ideas!

3. Tell the group how its accomplishments as a team were special, innovative, or unique. Tell them what they did that changed you or changed the way that you think about them. Sometimes it's difficult to put into words, but it's important that the team understands what coaching them has meant for you.

Recognizing the entire team, as well as praising each child individually in front of his or her teammates, will create a lasting memory of working with you and your team on Junior FIRST LEGO League.

4. Now, pat yourself on the back. You influenced the lives of these children and expanded their horizons.

Congratulations on a job well done!