



FRC Handbook

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SUPPORT AND COMMUNICATION

Support for your team is readily available and easy to find. If you can't find the information you need from the web site or the "FIRST Robotics Competition Game Manual," contact Team Support for help.

Help us, please.

It is crucial that we receive your feedback about this initial attempt at providing helpful information to our FRC teams prior to the Kickoff and start of the season. Please submit any comments as well as subjects you find missing or in need of augmentation or clarification.

We will make every effort to improve this guide. Please jot down notes as you read and e-mail them to us at frcteams@usfirst.org or fax them to 603 666 3907. In both cases, please use a subject heading of "FRC Handbook" Feedback."

Team Support

You can reach FIRST Team Support, located at FIRST Headquarters in Manchester, NH during regular business hours, from 8:30 a.m. to 5:00 p.m. Eastern Time. There are extended hours during the competition event season.

E-mail	frcteams@usfirst.org
Phone	603 666 3906, press 0 800 871 8326, press 0
Fax	603 666 3907

Field Support

Regional Directors, Regional Committees, and Senior Mentors cover specific territories and can help if you have questions for your locale or competition. Team Support can assess your need and direct you to a resource if necessary.

Use the FIRST Web site - www.usfirst.org

One way to familiarize the team with how FIRST works is to tour the web site. If you and the team are somewhat acquainted before the season starts, it will be easier for you to check for available scholarships, deadlines, grants, and the various award submission and shipping deadlines.

Read available guides: The following web site documents will help you get started in the right direction. Mentors should print and read the "ASME Guide to Starting a Team" and the "Mentoring Guide," <http://www.usfirst.org/what/frc/content.aspx?id=5504> Have everyone, including the kids, read the "Team Safety Manual." Find it in the "Team Resources" area

<http://www.usfirst.org/community/frc/content.aspx?id=478>

Get a jump on the season: For practice, rookie teams may want to consider how they would design a robot based upon the information in last year's FRC Manual and game format.

<http://www.usfirst.org/community/frc/content.aspx?id=452>

During the fall, take a look at last year's materials, and you will get a good idea what the upcoming season will bring. It's a good time to practice brainstorming and design. After the Kickoff, you will be able to find all of the new "FIRST Robotics Competition Game Manual" (FRC Manual) sections and the Updates as well as components of the individual events, such as dates, event agendas, and shipping and drayage particulars.

Get Acquainted With the TIMS

This is the system that provides *FIRST* with necessary, up-to-date team information. The on-line Team Information Management System (TIMS) allows the Main and Alternate Team Contacts to register and manage the information about their *FIRST* Robotics Team.

Pre-registration begins in August. Go to the “Headline” area or the usfirst.org web page. Access the Team Information Management System (TIMS) on the usfirst.org web page to begin the process. When you begin the process for a rookie team, you will receive a temporary, seven-digit team number, a password, and logon. When you register for your initial event, you will receive your official, four-digit team number. Established teams use their logon and password to update.

During the season, with computer-assigned but changeable passwords and their logons, Main and Alternate Contacts provide and update required:

- Team, contact, and partner/sponsor information
- Register for Kickoffs and events
- Provide helpful information for judges
- Supply team demographics.

For more detailed information refer to the “Communications” section of the FRC Manual. “The Calendar of Important Deadlines” under the “Documents and Updates” portion of the web site lists associated deadlines for each of the TIMS subject areas.

Communications from *FIRST*

This section talks about some of the critical ways FRC communicates with its teams, such as Team Updates, e-mails, and the Q & A Forum. There are also links to web sites in the “Team Resources” area that provide information on off-season events and other useful materials.

<http://www.usfirst.org/community/frc/content.aspx?id=960>

Team Updates

Once the season begins, teams should print and distribute “Team Updates” from the web site. Appoint two people, one as an alternate, responsible for web site monitoring and information sharing. *FIRST* tries hard to follow a designated posting schedule for this new information twice a week, more often if necessary. These announcements will include revisions to general notices; the Q & A System; e-mail blasts since the last update, rules, and the FRC manual sections.

E-mail Notifications

Team contacts will receive many e-mail communications during the year. It is important that the main and alternate contacts check for them often during the registration and competition season and every *day* during the build season.

Q & A Web site Forum

This team discussion area includes all sections of the Competition Manual, such as “The Game,” “Robot Transportation,” “The Robot,” etc. Anyone can view questions and replies on this system, but only those team contacts with the team username and password can post questions to it. Assign one team member to posts questions to avoid asking questions that have already been posted.

GRACIOUS PROFESSIONALISM, THE CORNERSTONE

A large part of the success of many teams and *FIRST* itself is the somewhat unique emphasis and approach to teamwork. The respect for peoples' ideas and methods is the foundation for overflowing brainstorming, innovation, and invention, huge elements for scientific success. Enough said. Read the pro's insights in the following paragraphs.

Dr. Woodie Flowers, *FIRST* National Advisor, asks and provides his view regarding the question, **"Why do *FIRST* folks talk so much about that phrase?"**

Quoting Dr. Flowers, "Obviously it would not make sense to endorse 'asinine professionalism' or 'gracious incompetence.' It is, however, completely consistent with the *FIRST* spirit to encourage 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 has purposefully been left somewhat undefined because it can and should mean different things to each of us. We can, however, outline some of its possible meanings. Gracious attitudes and behaviors are win-win. Gracious folks respect others and let that respect show in their actions. Professionals possess special knowledge and are trusted by society to use that knowledge responsibly. Thus, gracious professionals make a valued contribution in a manner pleasing to others and to themselves.

"In *FIRST*, one of the most straightforward interpretations of gracious professionalism is that we learn and compete like crazy, but treat one another with respect and kindness in the process. We try to avoid leaving anyone feeling like they are losers. No chest thumping barbarian tough talk, but no sticky sweet platitudes either. Knowledge, pride and empathy comfortably blended.

"Understanding that gracious professionalism works is not rocket science. It is, however, missing in too many activities. At *FIRST*, it is alive and well. Please help us take care of it.

"In the long run, gracious professionalism is part of pursuing a meaningful life. If one becomes a professional, and uses knowledge in a gracious manner, everyone wins. One can add to society and enjoy the satisfaction of knowing that he or she has acted with integrity and sensitivity. That's good stuff!"

COACH FOR SUCCESS

Coaches give "Attaboys," mentors are about "Here's how to do it," and facilitators are big on "I showed you, now you teach someone else." Your team mentors will probably use all of these methods interchangeably within the FRC program. Each of those expressions is a simplification of the processes that work well for teams. Remember to read the "*FIRST* Mentoring Guide" for tips on "paying the knowledge forward" with facilitation and using communication as the key component for building necessary trust and respect.

Beware: The design and build season is short – just 6 weeks. As coach, don't ever accept procrastination. The "we have plenty of time" statement is just not true with *FIRST*. Mentors will suffer most from stress when things come down to the wire. Keep your collective eyes on the calendar, kids included, and watch those deadlines!

Discuss the time commitment, meeting times, and dates up front with the team and parents. Let them know that at times, some of you may be meeting every day of the week. Remember that the students joined the team to have fun. Choose your sub team membership wisely, and encourage role flexibility.

Personal Growth: Successful coaching will encourage independent thought, open communication, and will help develop working roles within your team. Mentors and students will become united, with the kids learning mentoring skills through example. They become empowered by the ability to contribute and teach, and they in turn lighten the mentors' loads.

“Group Ear” and Agreement: A good way to get your team to have the right attitude is to strive for team consensus about important issues. Promote the concept of listening both as individuals and as a group. Listen courteously without interruption. If discussion drones on too long and team paralysis occurs, facilitate agreement by helping with the topic.

Help is out there: Develop a realistic action plan for the season through good planning, team input, well-rounded expertise, and continual bobbing-and-weaving problem solving. If you know people from another team, pick their brains for anything that might eliminate stumbling blocks and round out the learning curve for your team.

Use the TIMS to show that you would like another team(s) to mentor yours. *FIRST* teams are famous for lending advice, materials, and labor, and one day your team may be able to reciprocate. This is the bedrock concept and why the program works so well.

Useful Web Links: Check out the “Useful Web sites” links on the *FIRST* Web site for additional help with building your robot, troubleshooting, fundraising, training, or information about planning to attend an event

Brainstorming

Encourage “out of the box” thinking throughout the year. Brainstorming is a wonderful tool to get adult and students’ brains creating and working overtime. Be sure that you set down rules before you begin and document each idea in the process. To brainstorm effectively, capture all ideas on paper or whiteboard first and allow in-depth discussion later.

Encourage mutual respect. Allow people to disagree, but not judge the individual or let things get personal. It’s important that everyone feels safe enough to throw out an idea no matter how far out, so try to work toward comfort and confidence. Balance the session to include and encourage quiet team members to contribute while keeping others from monopolizing the time. Invite everyone to build on already suggested items, but avoid revisiting topics unless all team members agree to do so.

Consult the “Mentoring Guide” for more ideas.

Stress Levels

When your team is working long hours and deadlines are approaching like a storm, keep the team’s keel as even as possible. One way to do this is to make sure you provide deserved kudos, even when things aren’t going as planned. Keep your team’s eye on the bright side. There always is one! Take a little time to celebrate the accomplishments thus far in the season. List things the team has learned and acknowledge improved work habits to inject a positive, accomplished attitude.

Keep the kids focused on the task at hand and help them stay focused on the purpose and impending deadline. If you can make them laugh, good for you! Be a clown if you must, or get someone else to be silly when you are wound up tighter than an eight-day clock. It’s a proven fact that laughter lessens stress, and we all know we think better when our brains aren’t in vices. Do some stretches, run some laps, all the while smiling. Remind the team that it’s not all about winning. Roll out the levity. So what if your robot’s arm looks like a toilet seat! You all are doing great things here! If all else fails - snacks!

Attitudes and Tasks

Every team member should understand and embrace the feeling of pride, happiness, honor, joy, pleasure, satisfaction, admiration, and self-confidence. Commitment, promise, warranty, and trust are words that describe sentiments that come to mind for well-oiled, committed *FIRST* teams.

Every person on your team should experience these confident feelings when they work on and complete a job. Go easy on the criticism and lavish honest praise for jobs well done. It’s like sunshine to a garden or a bright campfire in a dark, damp cave. It works. We all need it.

Provide Job Descriptions

Describe each task to the appropriate parties and *be sure to ask if there is anyone who does not understand*. Once team members feel comfortable about admitting that they don't "get it," they will not be shy about making sure they know the ins and outs of every task. You will surely save time, wasted materials, and money if you make sure each is comfortable with the details and required level of expertise.

Give every job a description, a start and finish date, and a list of the designated people for that task. If the assignment is complex, facilitate with instruction.

Monitor Progress and Ask Questions

Check with the various team members or sub teams to make sure everyone is focused on the purpose and deadline and that progress is adequate. Do it gently. Ask if anyone has questions or concerns. If someone seems stumped, a good tool is to ask questions that may provide a hint about an easier, quicker, better, or more correct way to do the job. For instance, if you saw someone raking leaves up a hill, you would ask what would make the job easier.

If someone produces a part incorrectly, ask simple questions such as "Did you measure twice?" or "Did you look at the drawing?" to lead him to a solution for the error. This method teaches more than just doing it for him or telling him what he did wrong.

Give suggestions if you see that they are veering off course too far. Remember, this project may be the first time some of these youngsters have used tools or been tasked with a duty. Try not to take over the project so they feel incompetent.

Manage Punch Lists

Each sub team should learn to maintain a "to-do" list of items requiring immediate attention. Include deadline dates and the persons assigned to each task and a column for notes so the team can pencil in progress or problems and initial their notations. Highlight completed jobs to indicate progress and provide incentive. Label each list with the sub team's name and post them together in a convenient spot so everyone can get a feel for critical items that may impact their particular task or area of expertise.

Follow the Task Timeline

Refer to the Appendix for a generic timeline of the design and build season and beyond. This graph should help your team map out its own season and form sub teams with the correct overlap.

Write a Team Credo

During the fall, establish your own team philosophy that stresses the attitudes and respect that Woodie, Dean, and *FIRST* value. Brainstorm and record results. Listen to what the kids think. It's as important as hearing what adults contribute.

Include wording to encourage honesty, integrity, dedication, good judgment, and general all around positive behavior for all. Stress such things as keeping up with regular schoolwork. Define what the team can expect from both students and mentors.

Get your whole team to buy into the credo by signing what the team sets down as important. Let team members and mentors know that following the credo will be a criterion for membership. You will find that when the team is under pressure, the kids and mentors will remember what it is you are trying to create, a working robot and a productive atmosphere. Give each person a copy as they sign it.

DRAFT A FINANCIAL PLAN

If you are a new team, develop a team mission statement and business plan, and decide what your team goals are for the first year. Once you have experience as a team, it becomes easier to plan

ahead for a second and third year. Your goals will help determine the fundraising targets and recruitment of sponsoring partners.

Develop a budget for the team. It should include the registration cost, travel, robot and field construction items, publicity and sponsorship materials, and off-season event participation. The minimum budget for a team attending one local competition should be \$10k or \$11k. Refer to the sample budget in the Appendix for examples of some of the line-item costs.

Raise the Funds

Besides the registration and Kit of Parts (KOP) fee, this program requires money for additional parts and travel expenses. We recommend that you begin your fundraising efforts *well before* the extremely busy design and build season that starts in January. Start as early as you can, before the school year begins if possible. Use the following summer to get a step up on your subsequent season.

THINK BIG!! Ask for the full registration amount when you petition for funding, but be prepared to graciously accept any offer of help. Most teams survive on many small donations. If a company can't or won't donate money, be prepared to ask for services such as machining, mentoring, or meeting/facility space. Other in-kind donations could include tools, food, printing, copying, or T-shirts.

Visit the following web sites for information and fundraising ideas:

- www.fundraising-ideas.org
- www.fundraiserhelp.com
- www.stepbystepfundraising.com
- www.chiefdelphi.com, a popular, team-run web site, not officially *FIRST* sanctioned.

The Prospects

1. Look for companies that:
 - Produce innovative products and have a reputation for creativity.
 - Have a high profile in your area related to engineering, architecture, computers, hardware or software, advertising, community involvement, industrial or medical suppliers, pharmaceuticals, patent/copyright offices, technical development, information technology, manufacturing, or youth-focused corporations.
 - Employ the parents of team members. Perhaps one or more of the parents can help make contact with the company through the Corporate Giving Department for a donation.
2. Talk to the principal and find out if the school already has partnerships with local businesses. One of them might be interested in helping you start/maintain a team.
3. Find out who the largest employers in your area are by calling your state representative's office for information. Web engines having custom sorting capabilities, such as *Hoovers.com* and *Yahoo.com*, may provide leads about technical companies in your area. Many of these local companies may be interested in helping because they have a stake in your community.
4. Contact the Chamber of Commerce and request the names of companies that might be interested in partnering with schools on a project that will help these businesses develop a pool of future employees qualified in science and technical fields.
5. Research association web sites, especially those involved with engineering.
6. Submit an article to a local newspaper about your team and indicate the need for funding.
7. Visit www.usfirst.org for information about the setting up your team as a non-profit organization. One of our *FIRST* Teams has posted helpful information and links dealing with the requirements, qualifications, costs, and benefits.

The Approach

Potential sponsors will be interested in the positive publicity team sponsorship will provide and the long-term appreciation of the future student workforce on the team. Many smaller companies and individuals make great *FIRST* sponsors/partners. For instance, ask a sign company to donate a banner that lists your team's sponsors...and include their name on it. Mention that their banner will travel with your team to your event(s) and that you will proudly display it in your Pit station.

If you don't feel comfortable in this role, find someone else on your team who may have other contacts or more authority to make a presentation and subsequent agreement. The school principal or the science, math, or physics department head might be a good representative. If you already have corporate support, a well-informed representative from Manufacturing, Operations, IT, or other technical discipline would be excellent. Stress the value of youth investment as well as the inherent advertisement.

The Preparation

Before you speak with a potential partner, aka donor, sponsor, prospect, know who the best contact person is at that particular business or corporation. Very often it is best to try for senior management, such as the head of Engineering or Human Resources. You might want to talk with a person who is familiar with what the company and would like to accomplish good community relations in the area.

With dates and times in mind, be prepared to ask for and set up a face-to-face meeting. Know what you are talking about when you call or visit, and smile when you talk. Understand what *FIRST* is about, and be sure you can articulate it to another person. Be brief, but describe your team's makeup as to the number of kids and age bracket, team goals, and awards won or those for which the team plans to submit. Show enthusiasm!

Provide budget information and the amount you have already raised. You might also bring your own PowerPoint presentation about your team's plans for using the potential sponsor's donation. Whenever possible, bring the students to do some of the talking and convincing. Bright, enthusiastic young people are hard to resist!

In your presentation or letter, include some of the donation benefits to the potential partner:

- Promotes community visibility
- Presents networking and marketing opportunities with other sponsors
- Provides a pool for internships and future employees
- Re-energizes and renews the team-involved engineers' love for engineering

The Close

Don't forget to come right out and ask for the money. Ask high; they may be willing. *If there is silence after your request, don't talk at all.* Wait until the prospect responds, even if the silence is uncomfortable. Or, ask for a specific amount for a specific line item. If none of these works, try a compromise. Ask direct questions to identify objections and listen to what they are *NOT* saying.

If the meeting goes well:

- Thank the donor.
- Specify when you will need the money or promised support.
- Ask if there are employees who might be willing to mentor the team.
- Ask for referrals to additional support sources that may be interested in helping in some way.
- Request a digital image of their logo for use on the team's uniform and robot.

The Follow Up

Whether or not the prospective partner agreed to help the team, be sure to follow up with a thank you letter within a week. Include a couple of the information sheets such as *Vision and Theory*, *Impact*, or the *Tri-fold Brochure* from the usfirst.org web site

http://www.usfirst.org/community/resourcecenter.aspx?id=952&menu_id=148 Enclose a team brochure if you have one; reiterate your budget needs, and write a sentence or two on how their support will positively impact the future workforce of the area. Thank the prospect for the meeting.

Yes: If there was a promise of funding, machining, or mentoring support, send a letter of thanks and detail what you understand the agreement to be or what you hope the partner will provide as support. Mention what the direct impact of the donation will do for your team.

For engineering or technical promise of support, include a list of your needs, the above-mentioned printouts, and a sample teamwork schedule. Provide a synopsis of how you will use their support as well as your team's approach to the design and build phase. Is yours a student-build team with curricula in place to support this method? Do you expect the mentors to do most of the work and have the students observe and learn that way? Will the students have a role in managing aspects of the project?

No Commitment: If you send the letter and there still is no commitment, but you saw a glimmering of interest, ask someone with persuasive writing skills to keep the "prospects" abreast by sending a note about the team's progress during the build phase. Include a picture or two. Generate curiosity. Invite them to an event to see your team compete.

When the season is over, send a team and robot picture from an event. Detail some of the experiences, accomplishments, and excitement of the team. If there were newspaper articles, send copies. Try them again early during the next season. Be sure to let them know where and when they can see the team demonstrate or compete. *This works. Read this paragraph again!*

Research Grant Opportunities

A September/October activity: Check the web site area pertaining to grants. Grants are a good way for teams, especially rookies, to get a leg up on funding. They are usually offered right around registration time. Read about the various grants and their criteria, get started right away when the application is available, and comply with the stipulated deadline date.

<http://www.usfirst.org/community/frc/content.aspx?id=3190>

The NASA grant information will be linked from the usfirst.org web site. The NASA Regional grants have the requirement of participation in a NASA-sponsored event, so you will want to find out which events they are. To get a head start on the application process, read about the prior year's criteria and requested information. http://robotics.nasa.gov/events/first_application.php

FRAME OUT THE SEASON

The easier you make it for your volunteers and sub teams, the smoother things will go. Emphasize clear and consistent communication. As with most team activities, adhering to a published schedule may be a problem, so make sure everyone understands that things change and emphasize the need for flexibility and cooperation.

Season at a Glance

Fall – Set the Foundation.

Recruit mentors, students, sponsor partners
Register for events
Apply for grants
Fundraise
Train your team
Stress safety
Form sub teams
Attend an off-season event - students/mentors/partners
Research scholarships

Winter – Hit the ground running!

Attend a Kickoff
Brainstorm
Build a robot
Ship your robot
Make travel arrangements
Submit for awards
Apply for scholarships
Collect “Consent and Release” forms
Compete in events

Spring – Celebrate Successes

Attend Championship?
Recognize your sponsor/partners
Recognize your mentors, parents, teachers, students
Contact local media about your successful season
Participate in the Team Forum to provide feedback.

Summer – Maintain Momentum

Attend/participate in off-season events
Fundraise
Conduct workshops and training
Create community visibility opportunities:

- Exhibits
- Demonstrations
- Presentations to sponsor/partners

Consent and Release Forms

Ask mentors and team members to complete the mandatory “Consent and Release Forms.” Bring them to your initial competition event’s registration. Use only the current, web-posted version.

If these forms are required for the Kickoff your team attends, you must also provide them for the Kickoff as well as original copies for your initial competition event.

Scheduling

Timeline: Before the design and build rush and crush begins in January, you will want to establish a timeline for your team and various sub teams. You may want to use project-managing software for this purpose, calendar pages, or something as simple as a check-off list showing responsible individuals and dates. Be aware of dates when your school may have testing or event conflicts.

Meetings: Establish and publish a team work/meeting schedule, including an update and notification process. Include everyone on your notification list, or provide information to sub teams for dissemination. The sub teams should also keep you abreast of activities and progress.

Remember to consider the parents when holding and scheduling your meetings. Start and end them on time. Parents can be your best volunteers, so keeping them waiting lessens their enthusiasm for the program. Their time is valuable too; don’t step on their collective toes by extending team meetings or workshops. Plan for setup and cleanup when scheduling. Think about ways to include them in meetings and team activities. Include breaks as part of your work sessions to lessen tensions by sharing a few laughs, ideas, and accomplishments.

Team Fuel: Long meetings and workdays be more pleasant if someone provides meals or snacks for the team. Plan ahead and ask a parent to lead this “fuel” team. It’s an excellent way to involve parents

and reassure them that the kids will be fed. Volunteers will need to know where the team will be meeting and when, so have one of your mentors create a schedule and provide that information as needed. The sub team leader will need volunteer names, suggested food types, e-mail addresses, and phone numbers.

FIRST Web Calendar: Monitor the web site “Calendar of Important Deadlines.” Once the season begins, *FIRST* continually updates and adds items and dates to the calendar.

The Kickoff

This really great event unveils the game and marks the beginning of the design and build season. Whether it’s the big NASA-televised event in New Hampshire or one of the numerous “local” Kickoffs, you should attend! It’s just plain fun to get together with other teams, both rookie and veteran, to compare notes, get ideas, make friends, and get geared up for the exciting year ahead. Some events also include workshops for team representatives. Don’t miss the opportunity to be there!

TIMS Signup and Varying Site Options: Be sure to register for a Kickoff(s) in the TIMS by the deadline. You will be able to link to the web site to find nearby locations, event activities, workshops, and attendance restrictions. Teams can attend more than one Kickoff. If possible, register for a Kickoff having workshops.

Options for Receiving the Kit of Parts: NOTE: The KOP is expensive to ship and cannot be brought on a commercial airline, so you should make every effort to attend a nearby Kickoff.

1. **Attend Kickoff and pick up KOP** - If FRC teams continue to enjoy the, generous support and donation from FedEx Express Freight Service, you will be able to pick up your KOP at a Kickoff without a shipping charge. (FedEx ships pallets of KOPs to the local Kickoffs for team pickup)

By the deadline, each team must designate its Kickoff pickup location via the TIMS. Each team must send one of its adult team members to pick up and sign for its kit at the team-designated Kickoff. The KOP shipment is heavy and comprises 2 large totes and several boxes, but it fits in most car trunks.

Kickoff Registration and KOP Receipt: Each team must register at the Kickoff. Teams that indicated that they would attend the Kickoff will receive the team’s pre-printed KOP Receipt. The team’s adult team representative will go to the kit pickup area, collect the KOP items, check each box on the form upon receipt of the designated boxes/totes, sign it, and return it to the appropriate volunteer. *FIRST* must have a signed receipt for each team attending a Kickoff for audit purposes.

2. **Team pays for shipment** - If you don’t inform *FIRST* of your Kickoff choice, or if you do not want to or cannot attend a Kickoff, the team must pay for the KOP shipment. The team must provide an account number for FedEx, UPS, or Purolator shipping company in the TIMS by the designated deadline in December. The KOP will ship the early part of the week following the Kickoff. The KOP shipment is heavy and comprises 2 large totes and several boxes, so the shipment will be costly.

KOP Inventory Deadline: You will receive a list of the items contained in the KOP and you will be able to compare your kit items to the pictures and the list. Teams have four days to inventory their parts and report any shortage, via the TIMS, before the deadline, *midnight Wednesday following the Kickoff*. For auditing purposes, *FIRST* catalogs teams’ KOP receipts/shipping verifications and maintains the teams’ replacement parts lists annually.

The Game

As soon as the game is revealed at the Kickoff, you will want to get your team going on becoming familiar what the game is all about. Have everyone read the game description several times and have a meeting as soon as possible to discuss the objectives and scoring. Some teams begin discussing the game as soon as they arrive home from the Kickoff.

Brainstorm to see what your team thinks would be some good strategies for your robot. Get all the ideas out there on paper, no matter how “out there” or farfetched they sound. Once your team has some reasonable strategy ideas in mind, get your sub teams going on the autonomous and visioning modes of the game as well as designing the devices necessary to scoop, shoot, or scatter; place, pile, pillage, horde, or hang the game pieces where they work to earn you the best score.

Read the queries and answers on the web site Q & A forum to clarify any rules questions you might have. If you don't see the answer and you have read the appropriate Manual sections, post the question. You must refer to the Manual section needing clarification. Watch for the official answer in a day or two. It is possible that your question, while unique to you, will have an answer that refers you to the answer for a previously asked question. This method helps maintain that all questions relating to the same concept will be answered the same way, rather than re-phrased multiple times. *Remember that the FIRST Web site is the only place to find official answers.*

A critical team exercise is to constantly monitor the “Team Updates” and all *FIRST* e-mail blasts for game updates or clarifications. File them in a consistent manner so you will be able to refer to them easily and quickly.

Drive Team

Form a robot drive team with backups and make sure they are ready to compete. Practice time should include both groups in case of illness or “stage” fright. Most teams use two joysticks to run their robot, so the operators must be able to communicate with each other using a minimum of words. The field coach can be a student or adult and cannot score for the team. He/she must be calm, not a shouter, and shouldn't talk with his/her hands. The drivers can't see hands. This person relays referee information and assists the team in predetermined strategies or makes changes if necessary.

Scouting and Alliance Pairing

Thorough scouting and choosing alliances are a part of the process at the events. Teams usually have team members monitor other teams at the competition events. These “scouts” look for talents and mechanisms that work well with or augment their own team's robot abilities - or not. If your team doesn't have a mechanism that scores well, or your robot doesn't do well in the autonomous mode, know which ones do. This is especially useful for knowing opponent capabilities and choosing complementary alliance partners should your team make it into the final rounds.

There is only a short time before the pairing process for a review of your scouting list. Prior to the event, create a table/worksheet that will help track other participating teams' strengths and weaknesses. Include likeness of the field so scouts can remember/describe what the robots do. The person you choose to be your team's alliance captain for the alliance-pairing process should have this record or a similar sheet with him/her during the pairing. It should have the team numbers clearly visible so he or she can check off those teams already chosen and no longer available as partners.

The Competition Tournaments

The following sections attempt to give a short description of the FRC competitions where robotics teams compete with machines they have built and programmed in both autonomous and driver-operated modes.

The Excitement

These tournaments may well be the most exciting and rewarding competitions you will ever be a part of or witness. The teams are extraordinary and their accomplishments staggering. Just being there is like no other reality show. The kids are exceptionally talented. Their robots are uniquely marvelous and technologically varied. The matches are bang-up, spine-tingly, hair-raising climaxes to the teams' season of personal stretches and strivings! And they are oh so much fun.

The Overview

The official competitions are either Regional Tournaments or the Championship. Sample agendas in the “At the Events” section of the Manual provide a scheduling overview for both event types. Event times may vary.

All competitions have a Pit where teams work on and repair their machines in their pre-numbered team pit stations. A *Pit Map* will show teams the pit stations and a specific competition queue line to the playing fields. A group of queue volunteers guides teams to the correct field and competition station. There is also a specified travel path for return to the Pit.

The on-site event Registration provides a team packet, which includes a *Practice Schedule* for actual pre-match field experience. Teams may take part in practice matches prior to their robot passing inspection, but it’s a “pass-to-compete” for the actual competition.

Games, field setups, rules, and goals are different from year to year; however, the actual matches are usually about 2 ½ minutes long. The field size may also vary year to year, but usually measures about 55 feet by 25 feet. It is boundaried by a short, gated guardrail on the long sides with an alliance station wall at either end of the field. Drawings and specs are available each year.

The players bring their controls to compete within their protected competition station, diamond plate for the lower portion and a transparent, acrylic view area for waist-high and above. LEDs show the competitors’ team numbers above each station.

The Players

Generally, there are four people from each team permitted in the queue line and on the playing field. The person acting as the “on-the-field” coach can be a student or an adult, but he or she is not allowed to score. Typically, the game specifies that each team must also have two robot operators and a human player who score for the team. They must be of pre-college age/status. To gain access to the field, these four must bring and wear their mandated ANSI Z87-approved safety glasses. They must also wear the required, team-specific operator badges provided at registration.

Usually, two or three teams play together against two or three other teams, forming competing alliances. The next match may have a team competing against one of their former alliance teams.

Event Support

The Pit Administration Station is the hub for registration and information. If you need help, that’s where to go. All events also have a nurse or EMT available for illness or injury, and if you have shipping questions, there will be a representative to help.

Judges

These volunteers watch the competitions and talk with teams to evaluate performances and sportsmanship, attention to safety, and knowledge about their robot’s construction and operation. Judges confer and decide which teams have earned the awards and they present trophies to the winners during the Awards Ceremonies.

Spokespersons

Consider having a few students groomed and ready to lead the group when talking with judges or Pit guests. These team representatives should be familiar with and be able to speak about the team and its members, its robot and its processes, as well as team-encountered problems/solutions of the season. They must also be able to speak above the loud Pit noises.

The Regionals

These competitions are usually held in geographic areas with large numbers of registered teams, and the program is growing so rapidly that we are expanding to include some international events. Many of our veteran and some rookie teams compete in two or three Regionals. We organize the events with consistency in mind; so all events must meet standard requirements.

In order to adhere to the published schedules, the number of matches is adjusted to accommodate the number of teams. If the event is a small one, there will probably be more competition matches. Some events include an optional team social and some do not.

The Championship

The Championship is a huge version of the FRC Regional events and includes FLL, JFLL, and FTC competitions/demonstrations. Picture your team under the lights in a huge athletic dome. It's like having four huge Regionals going on at the same time. Final rounds culminate with winning alliances from each of the divisions competing sprocket-to-sensor for the Championship title.

In order to register and participate in the Championship, teams must meet the current eligibility criteria and compete in at least one Regional during the competition season. *FIRST* tries very hard to make the Championship available to all teams.

Teams can qualify for the opportunity to register for this event by meeting eligibility criteria during the prior or current year. The tier system, which is dependent on the amount of time since a team's previous Championship attendance, is another way to become eligible for Championship registration. Rookie teams have to earn their way to the Championship by winning the Rookie All-Star or one of the other specified awards. Many do just that!

Besides FRC, the Championship welcomes and spotlights the *FIRST* LEGO League (FLL) exceptional International and U.S. teams at the a wonderfully diverse World Festival competition on Thursday and Friday. Children ages nine to fourteen proudly show their presentation and programming skills.

RESEARCH AVAILABLE SCHOLARSHIPS

Eight million dollars worth of scholarship offerings are available to participating students in the FRC program! It is important that students know about these opportunities and take advantage of them. Designate someone at school or on the team to research them on the web site and reveal them to the team members and their parents.

Start Early

Review the scholarship listings for the previous year during the fall before the Kickoff, to offer students the ability to get a head start on the application process and required information submission. Once robot construction begins, students get really busy and mentors may be too busy to write the often-required recommendation letter. If most of the requirements and questions are already thought out and in the draft stage, it is far more likely that students will get the current year application completed on time.

Timing is critical

Most of the scholarships are awarded during the senior year, but some are given during the students' junior year. The application deadlines vary, but most are in February or March. The awards differ, and most of the schools require that students apply and receive acceptance to their school before they can submit a scholarship application. Many of the schools will absorb the application fee. Most scholarships go to students pursuing a scientific or technical degree, but there are some for more general studies also. Don't let this opportunity slip by!

SET YOUR TEAM APART

Establish Your Team's Various "Names"

During the registration portion of the season, you will be inputting information about your team's names in the Team Information Management System (TIMS). At *FIRST*, we recognize the team number and the official name. Read below for name descriptions and functions.

Official Name

This one is generated automatically when you enter any sponsor/partner into the TIMS. The official name is what we print in *FIRST* documentation, so be sure to list your sponsors and the school(s) by the first of December, the deadline for the Program Books. It is important to honor your partners in this way, and *FIRST* also includes them in the Annual Report.

Nickname: The team comes up with this one. Once the season gets going, have a team naming activity that includes everyone. Have some fun with it and when you are name brainstorming, think about potential costumes and logos! Many teams use their school's mascot as part of their name such as, TigerBots, Robo Lions, or Metal Knights, and others come up with something way out of left field, such as Miss Thelma. The deadline for TIMS Nickname input is usually mid February, but you are better off getting this done before the Kickoff - before the holidays is even better.

Scoreboard "Short Name": This name can be no longer than 21 characters and should include partners and school. As you can imagine, sponsors love seeing their names up on those scoreboards!

Establish Your Team's Personality!

Stylin'

A big part of the team fun is individualizing your appearance. Of course it's optional. Some teams just have some nifty T-shirts and trading pins, while some wear complete, matching outfits, stylized or dyed hair.... pink, blue, or red....with sparkles yet! Grown men and women get into this too, and have so much fun in the process!



Mascots

You will see colorful soup cans, caped wizards with pointy hats, Oompa Loompas, cheerleaders, and just about every common furry or morphed animal. This mascot is right with the program!

Keep safety in mind when planning your team and/or mascot's costume and consider things like clear vision and temperature when designing.



Logo

Once you choose your team's nickname, you may want to come up with a team logo to incorporate with your image. Keep your logo simple because each color you use costs more to print. Have some fun with it like this team did!

For information about the *FIRST* logo, refer to the "*FIRST* Robotics Competition Manual" or the web site for logo restrictions.



BEGIN TO REGISTER YOUR TEAM

The "Pre-registration" stage of registration encourages teams to become familiar with the TIMS by inputting basic information prior to the actual event registration. This phase must be complete before a team can actually register for an event. There are "Help" screens associated with this progressive process. We suggest you download some of the more involved ones.

The Process

This on-line process, via the usfirst.org web site, usually begins mid September with official event registration beginning early October and ending early December. Before starting the TIMS on-line process, gather the contact information for those persons you wish to have as Main, Alternate, and Shipping Contacts. (*These persons must be post high-school-aged adults*). The school(s) and sponsors are considered partners. Use the worksheets for this data collection. Find them on the TIMS registration front page by clicking where it says, "Click here for a description of the registration process." Allow plenty of time for this process - at least an hour. Input the required information:

- Work and home addresses
- Two e-mail addresses
- Phone numbers
- Additional contact information
- Partners

Notes about the TIMS:

1. The Main and Alternate Contacts will each receive a unique password. Using e-mail address and that password, each will be able to enter the TIMS to add or update information about the team or contacts. These persons do not necessarily have to be the hands-on mentors, but should be dedicated to making sure they distribute, as appropriate, whatever important e-mails *FIRST* sends to the team.
2. It is very important that the e-mail addresses for those team contacts are not restricted by a firewall that filters messages from usfirst.org and allows attachments of up to 2 MB.
3. During the process, use the keys that will save your work, such as "OK" and "Finished." Use the "Back to Team Summary Page" or the "Log Out" areas at the top of the page. Your information will **not** save if you use the system back arrow key .

Rookie Team or Not?

Go to <http://www.usfirst.org/community/frc/content.aspx?id=6632> for a complete definition. The following is the answer in a nutshell.

Rookie - If your school has never been involved as a *FIRST* team or has not been involved during the past three years, you will be considered a rookie team.

Not - Past Involvement: If your school has been involved within the past three years of the present registration, your team cannot be considered a rookie team and must register under the existing team number for your team. Contact *FIRST* via frcteams@usfirst.org if you have forgotten the team number, password, or logon.

Not - Team Split / Expansion: If your school was a part of a team and is splitting to form a new one, your team cannot be considered a rookie team. Contact *FIRST* via frcteams@usfirst.org, explain the situation, and you will receive registration instructions. Your second team will receive an unused team number associated with the timeframe/year your school became involved as a team.

Team Number: Upon completion of the whole process, which includes online event registration, you will receive a four-digit, permanent team number that will remain constant and linked to your team through the years.

Event Registration: Registering for events is a staggered process. There are deadlines for choosing a first event, second event, the Championship, and an unrestricted time to choose additional Regionals. These choices are open from the end of September to the beginning of December. For specific dates, refer to the “Calendar of Important Deadlines” on the web.

Event Choice Considerations

Have someone do some fact finding before approaching your team with Regional event location choices. Keep the following in mind:

- **Research Grants**: If you want to apply for a NASA grant, determine which are this year’s NASA-sponsored events by clicking the web link in the grant area.
- **How to reduce travel costs**: Check on hiring a bus if the event is fairly local, and compare train and plane fares if not. Ask the airlines if they give group rates and carefully check the stipulations. Consider having the team stay Saturday night in case event runs long. Compare the hotel cost versus the airfare you save by staying over the Saturday. It may be a wash.
- **Establish Arrival and Checkout Times**: Check the sample agenda in the “At the Events” section of last year’s Manual to find general starting/ending times. You will probably want to have at least a 3-person team, (at least 2 adults) arrive at the hotel Wednesday evening so they can arrive at the Pit early Thursday morning to uncrate the robot, register, set up the team pit station, and begin robot inspection. Conceivably, the rest of the team could arrive between 8:30 and 10:00 am when the Pit will be open to all others and practice rounds begin.
- **Hotel Reservations**: *FIRST* has a reservation system in place for the Championship only. Using this system, you will be able to register your team for a block of rooms via the web. The accommodations will be on a first come, first served basis.

NOTE: There is no shuttle service from hotels to events, so the hotel should be close and safe enough to walk to the event, or you should arrange for transportation to and from the event.

- **Consecutive Weekend Events**: If you choose to participate in events that are on back-to-back weekends, be aware that there are “arrival at the drayage site” deadlines. We do not recommend that teams register for consecutive weekend events when they are located more than 1,000 miles apart.

The complimentary shipping option will not work for these back-to-back shipments, and there are shipping regulations requiring robots to ship with the designated carrier to these events. *You cannot use your own shipper when shipping between events.* Shipping the robot to arrive on time to the second event will most likely be expensive because of the expedited method of the shipment.

Back-to-back event shipping is not possible for teams going to international events, including Canada, because of potential problems with Customs and border crossings.

- **Shipping and Customs:** If you plan to compete internationally, check the shipping and Customs requirements well ahead of time, and be sure to comply.

ESTABLISH SAFETY STANDARDS

One of the first things a team should do is get *everyone* to think about safety in the “workplace,” during team travel, and at the events. Bring up the topic at your first meeting and mention that each person will be responsible for team safety as well as his/her own. Stress safety at each meeting!

Safety Captain(s)

The Safety Captain will be a valuable member of your team. Refer to the bulleted items in the sections below for specific team safety education items and concerns. With a mentor presiding, have the students meet to establish safety rules and plans to enforce them. If the kids embrace the guidelines as their own ideas, they will be much more likely to follow them.

The Safety Captain would be in charge of identifying safety hazards and implementing corrections with the coaches’ help. This may be a good role for a responsible, interested student. He or she could work with a committee to make and post signs about team safety. Consider having the team vote for the Safety Captain position rather than having it an appointed position. You might also consider a person new to the technical area.

At each team’s initial competition event of the season and the Championship, there will be a Safety Captain badge in the registration packet. Consider having more than one captain and having them alternate being “on watch.”

Safety Concerns

Most of the following points are from a PowerPoint presentation one of our teams produced. Use these as a starting point for your safety discussions.

- Mandatory, non-shaded safety glasses that meet ANSI Z87 standards
- Open-toed shoes are not allowed at events
- Stored energy hazards - electrical, mechanical, and pneumatic: Springs, chains, and gears; batteries; pneumatic cylinders and lines, extended “arms,” bound joints, and lifted weights. Release stored energy before you power down; return it to its “home” position, and power off the equipment.
- Hazards of the autonomous mode
- Harmful dust/fumes and protective masks or respirators
- Chemicals and exposure
- Electrical hazards
- Welding and brazing - appropriate eye and hand protection
- Pinching and crushing
- Trips and falls prevention

- Protective equipment
- Loose clothing, long hair or jewelry, and moving parts
- Proper lifting technique

Some teams establish a system for monitoring team safety and use a checklist to document both good work habits. Bring this information to the competitions. Judges are extremely interested in safe habits and safety education and what you learned from blunders.

Team Safety Education

One of the really important aspects of the program and the events is safety. It's so important for your team to be conscious of work habits in your own environment and at the events. Take the time to explain what the events will be like so everyone knows what to expect.

You will find that they are booming with team spirit and noise. You will also find that there is a real push to ensure that teams and guests are safe.

- Appoint a Safety Captain who will be responsible for:
 - Starting a safety program
 - * Maintaining a safety training log
 - * Recording improvements, such as team members using approved safety glasses, gloves, as well as safe lifting, drilling, and machining practices at work sessions.
 - Showing the UL safety training DVD and discussing it with the team. *FIRST* recommends that teams do this soon after Kickoff. Show it again before the events.
 - Training the team about safety in the workplace and at the events.
- Create and include a "Best Practices" safety document within your safety program.
- Invest in having one or more Mentors certified in First Aid.
- Provide hands-on training for power tool operation. Include instruction on any associated safeguards and their functions.
- Establish and discuss procedures for reporting an accident or safety violation to the mentors.
- As part of your safety documentation, set down workplace safety expectations for your team. Remind team members that over-familiarity with the robot or various tools can lead to a lax approach to safety.
- Set team travel and safety rules in writing and distribute them.
- Download and read the "Team Safety Manual." Review it with everyone before the season begins and then again before you leave for an event.
- Familiarize the team members with the Safety Awareness and Recognition program and get them excited about earning safety tokens at the competitions. Review the restrictions in "Site Info" for your event.
- Refer to the FRC Manual for information and rules regarding the Pit, queue line, practice field, and competition field. Before you make plans for your pit station, learn about its size, use, and height restrictions.

Buddy System

Begin the buddy system as soon as you begin meeting, and ensure that the students have at least one partner at your work location, while traveling, and at the events. If an accident or problem occurs, there is help right at hand; and it's less scary to be lost with someone else. When traveling to events, make sure the students also have the mentors' contact information and room numbers.

Safety Equipment and Best Practices

Read the "FRC Team Safety Manual" to become familiar with the location and use of the following safety items at your workplace and events:

- Ear Plugs
- Fire Extinguisher
- First Aid Kit
- Safety Glasses
- Gloves
- Robot Cart
- Safe Lifting

RESEARCH PARTS/TRAINING INFORMATION

Allowable Parts: The kits are usually quite similar from year to year, so before the season begins, take a look at last year's Kit of Parts (KOP) list on the web site for an idea of what it contains. This is a very large document that contains many good parts pictures, so it takes some time to load and print. Also look at the "Additional Material List" to see what other items were allowed for building *FIRST* robots.

Mentoring/Philosophy: The parts lists may also indicate what areas you may need to research for types of mentoring your team may need. The information will also help you become familiar with the general philosophy regarding the kit and allowed materials.

Spare Parts: It is important to have spare parts on hand so they are available to your team during the build season. An experienced, mentoring team can help you decide what parts are valuable to have on hand. Become familiar with the replacement parts policy of KOP items. During the season, check the "At the Events" section of the current Manual for the very short list of replacement kit parts that may be available at the competitions.

Team Resources: Check the web site under "Team Resources" for web workshops, the safety program, and mentoring.

These sections contain downloadable presentations, helpful documents and links both on and off the *FIRST* site to help you have a successful season. There is information about grants, safety, workshops, conferences, curriculum and archived game documentation and event results.

Technical: For technical help, go to "Team Resources" and choose "Technical" to find tutorials, information about programming, camera codes, driver station kits, and pneumatics, etc.

<http://www.usfirst.org/community/frc/content.aspx?id=482>

Sustainability: Read about NEMO, Non-Engineering Mentor Organization, and the help it provides. This support group and information exchange helps those adult non-engineering mentors helping *FIRST* robotics teams. In this same area, you can look at "*FIRST* Interactive Rural Support" and "Team in a Box," designed to help rookie teams and their mentors get started with sustainability the aim. <http://www.usfirst.org/community/frc/content.aspx?id=6876>

KNOW THE GAME

When the game is revealed at the Kickoff, educate your team going on game concepts, meeting as soon as possible to discuss the objectives and scoring. Some teams begin discussing the game as soon as they arrive home.

Brainstorm for good robot strategies. Get all the ideas out there on paper, no matter how “out there” or farfetched they sound. Once your team has some reasonable strategy ideas in mind, get your sub teams going on the autonomous and visioning modes of the game as well as designing the devices to scoop, shoot, or scatter; place, pile or hang game pieces where they earn the best score.

PURSUE AWARDS

Most of the awards presented at the events are evaluated at the competitions by judges who interview the team members to watch and listen to what they, adults and kids alike, say and do. Judges watch robot and team performance. Be familiar with the criteria for on-site awards and those requiring pre-event submission.

There is a pre-season Safety Animation contest, with the winning entry highlighted during the Kickoff in early January. There are also a few awards that teams work on and submit entries for prior to posted deadlines. For instance, Autodesk donates software to teams and judges submissions using posted criteria. There is also a judging for team web sites.

Teams can honor one of their hard-working mentors by submitting an entry about her/him for the Woodie Flowers Award. You can also try for the Chairman’s Award, the most prestigious honor your team can earn. Before the rush begins, have the team read about all of the possibilities in the FRC Manual “Awards” section.

CELEBRATE THE PROJECT

Your robot is well on its way. It’s sturdy; it’s strong; it’s working, and it’s safe. Don’t let this end-of-the-season time implode into an anticlimax. CELEBRATE your team! Little did you know what your team would accomplish in so short a time or how much your team would be willing to give.

What can you do to celebrate your team’s high-spirited energy and accomplishments? You, the team mentors, parents, and volunteers have taught and guided these fresh, young minds through so many stages. You all have experienced success, disappointments, and failures, maturing in the process. You have become a working team and a promise to the future. They will not forget the foundations you and the other volunteers have grounded in their tomorrows.

Prepare To Acknowledge Each Person

As the season progresses, make notes about accomplishments and growths of the individual team members. You may want to have a sub team working to create templates for awards presentations during the season. This would be a great job to assign to your team’s graphics stars.

At the season’s close, take some one-on-one time for each team member and tell each one how she or he contributed to the team. Remind them of the great ideas they had, the problems they solved, the way they supported teammates, the things they mastered during the season, and the growth you have seen. This is your most important job as a mentor, so take time and be thoughtful about what you say to each participant. If your team is a large one, ask the sub team leaders to gather information about their crews. This positive reinforcement is a great way to encourage the students and mentors to return for another competition.

Recognize Your Team Members

With your team, plan a celebration and invite family and friends to see what you all have accomplished. Ask your school to hold a special assembly or your sponsoring organization to hold a team social. Display the team's safety program documentation, demonstrate its robot, and showcase team mementos, journals, photos, and awards submissions.

Medallions

This might be a good time to present the bronze participation medallions you received at your initial event. If so, you may want to postpone the celebration if you need more than the allotted 25. You can order more beginning mid May, ending mid May.

Certificates

Some teams provide certificates to each team member, with special recognition of the contribution each person made during the season. You can mix and match using future professions, mastered skills, or special awards as below. Be creative when awarding them, and use the *FIRST* logo from the *FIRST* Robotics Competition Resource Center on the web to make them even more special. Put names on each, and be sure each student on your team receives one.

Special Learned Skills: This kind of recognition helps kids understand how their newfound skills and talents translate to the professional world. Recognize a special skill of particular team members, such as welding, programming, media production, or robot painting.

Future Professions: To help with the certificate project, ask the team to write down what each member contributed as an end-of-the-season teamwork exercise. Show the contributions other team members cited. You could also ask team members to vote on the future profession they think each team member may pursue, such as Most Likely to "Invent Something to Change the World," "Create a New Computer Program," "Run a High-Tech Company," Be President of a Research Facility

Special Presentations: Ask the kids to review the positive values they have experienced as a result of participating in FRC. Choose one that each member best exemplifies. This is a great way for the kids to understand that their contributions to the team are greater than the tasks each one took on. One person might receive a Gracious Professionalism award, and another the Spirit of Safety.

Applaud Your Sponsors, Mentors, and Volunteers

Invite them all to your party. Be sure your team recognizes the contributions of mentors and volunteers at the end of the season. The team can present its sponsor representatives, coaches, and mentors with a framed team or robot photograph, a certificate, or a letter recognizing the special talents she or he shared. The same goes for the partners/sponsors. This personal recognition will encourage their involvement next season. Recognize the portion of the season they enabled. Tell them how you spent their donations. Giving a gift with the *FIRST* logo is a great way to remember volunteers, mentors, or sponsors. Visit the *FIRST* on-line store.

Salute the Group

Begin or end the celebration by telling the group how their contributions and 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. You may ask several mentors to help you. Sometimes it's difficult to say the words, but it's important that the whole team understands what coaching them has meant for you.

Recognizing the entire team, as well as praising each student individually in front of his teammates, will create a lasting memory of working with you and the FRC team. It will encourage them to return for the next season. If they are graduating, it may result in them returning as mentors.

Now pat yourself on the back. You have had a positive influence on the lives of these students and have helped expand their horizons. **Congratulations on a job well done!**

APPENDICES

Appendix A: Budget Samples

Sample Budget: One Local Regional Event

Cost	Items
\$6000	Registration for a regional competition, includes kit of parts and <i>FIRST</i> team support
1500	Additional parts and shop materials
500	Practice field components:
200	Shipping crate (consider asking school construction class for materials)
100	Robot cart (could be flat dolly constructed from leftover wood)
1000	Travel costs: bus transport to Regional for 3 days
100	Publicity and sponsorship materials:
500	T-shirts & marketing materials
0	Robot shipment – Used FedEx donated shipments. (Refer to “Robot Transportation” section of the Manual)
500	Post-season events. Set aside money for participation. Besides being fun, they provide more experience for your team and possible press coverage.
Total: \$10,400	

Budget Note:

This budget does not include any designation for food at meetings or events, nor is there an allocation for hotel stays.

Sample Budget for Two Regional Events

(Teams should budget at least \$10,000 for a local event)

Two Competitions	Cost	Notes:
Local Regional (\$8,300)		
First event registration	6,000	
Lodging for 3 nights	2,100	7 rooms: 14 students - \$100/room/night
Team buttons/trinkets	200	
Robot ship – dropped off at drayage facility	0	
Second Regional (\$8,920)		
Second event registration	4,000	
Travel	2,200	8 students at \$275 each
Lodging	1,200	4 rooms, 3 nights - \$100/room/night
Rental vehicle	1,320	
Team buttons/trinkets	200	
Robot – free FedEx	0	FedEx free between events and home
Materials (\$1,190)		
Electronics	595	
Speed controllers	345	
Sensors	200	
Controls	50	Operator interface controls and connections
Construction (\$1,615)		
Metal, etc.	250	
Sprockets, chains, bearings, etc.	500	
Wheels	140	
Polycarbonate	50	
Hardware	250	
Signs	50	
Playing field	300	
Shipping crate	75	
Miscellaneous (\$1,239)		
<i>FIRST</i> LEGO League	264	Sponsorship of a middle school team.
Tools	300	
Web site	175	
Off-season event	500	
TOTAL EXPENSES	\$21,264	

Important Team Finance/Budget Notes:

1. This budget has not allocated for food during meetings, practices, or at the events.
2. The team was able to drop off their robot at the first event's drayage facility, thus saving a shipment cost. The team used the FedEx free shipment for the second event and the return shipment home. Check the FRC Manual for specifics and stipulations.
3. The team received a school-funded grant and field trip payments for the two events, which together totaled about \$6,500 in school support. The student body and booster club contributed over \$1,800, and the balance came from fundraising and individual and sponsors' contributions.

Appendix B: Sample Schedule and Checklist

Sample Robot Competition Work and a Brief Event Schedule

APPROXIMATE WORK HOURS	
Various sub teams: Monday through Friday 5pm to 9pm – Weekends 9am to 3pm	
Kickoff Weekend:	
Kickoff Meeting – Game and rules announced - Saturday Team game and rules review - Saturday or Sunday Team meeting to plan game strategy / form sub teams - Sunday	
Week One: Formulate Design Ideas	
Sub teams develop design ideas Complete design ideas - Determine the “ <i>what to do</i> ” before the “ <i>how to do</i> ” aspects of the robot Team meeting for sub teams to present design ideas	
Week Two: Design / Integrate Systems and Components	
Order Parts Sub teams - Design systems and components Complete system designs, component drawings, and parts list	
Week Three: Fabricate / Procure Components	
Fabricate components Complete component fabrication and procurement	
Week Four: Assemble Robot and Shipping Crate	
Sub teams assemble robot Complete robot Build / check robot crate for sturdiness	
Week Five: Develop and Test Robot	
Test, refine, and develop robot Complete testing and development Start the Drive Team practice process	
Week Six: Game Practice and Revisions	
Drive team practices and team makes final robot/play revisions Prepare robot for shipment	
Week Seven:	
Ship Robot by Deadline Team meeting for review of: Robot design Competition sub teams’ rules knowledge Competition needs Collect completed Consent & Release Forms for registration at initial competition Safety – Ensure enough ANSI Z87-approved safety glasses for team at competition Travel safety, venue safety, buddy system, etc. Provide contact information	
Regional Competition:	
Thursday	Registration, pit station setup, practice rounds, robot inspection, shipping documents
Friday	Opening Ceremony, Qualifying rounds, Awards Ceremony, Team Social if applicable.
Saturday	Opening Ceremony, Qualifying and final rounds. Ship robot from event home or to next event, Awards Ceremony, pick up participation medallions.
Championship:	
Wed. Eve.	Three-person team to register and uncrate robot. (Optional, at least 2 adults)
Thursday	Registration cont., uncrate, pit station setup, inspection, and practice rounds
Friday	Qualifying rounds
Saturday	Qualifying and final rounds, ship robot from event, Awards Ceremony, <i>FIRST</i> Finale.

Team Checklist: Pre-Season Through Event Preparation

Starting a new team takes a lot of organization. The following is a suggested pre-season through design and build phase “to do” list for new and returning teams.

Before the Season Starts

- Consider linking up with a veteran team for pre-season activities
- Recruit your team: mentors, parents, and students.
- Find a meeting place and meet with site host.
- Determine how the team will cover its costs.
- Find sponsorship.
- Determine which computer the team will use for Autodesk.
- Set up a competition area.

Your Team and Organization

- Make your initial meeting a friendly meet and greet.
- Review FRC values and gracious professionalism.
- Learn as much as you can about FRC by familiarizing the team with usfirst.org web site.
- Decide how to organize your team.
- Create a meeting schedule.
- Create a team credo/contract.
- Host and Open House.

Success Tips for Learning and Mentoring

- Read the “ASME Guide to Starting a *FIRST* Team.”
- Read the “*FIRST* Mentoring Guide.”
- Check out the workshop resources on the *FIRST* Web site (usfirst.org).
- Use team meeting time for training sessions.
- Run team-building exercises.
- Learn and teach the basics of pneumatics, electrical, programming, mechanics, etc.
- Create a safety plan and monitor the program.

Team Logistics and Preparation

- Practice brainstorming
- Purchase supplies, tools, and 3-ring binders. Have someone maintain binders for *FIRST* documents, research, design ideas, and test data. This may prove valuable in future years.
- Print out last year’s Manual sections to familiarize the team with the season.
- Go to an off-season event with your school principal, potential sponsors, and team members.
- Send a note to parents requesting team members’ emergency and medical information.
- Schedule technical mentors or specialists if possible.
- Schedule weekly preparation times.
- Research travel options and hotel rates.
- Choose and register for your event(s) by the deadline(s).
- Build a practice robot.
- Install software on computer(s), adhering to the site license requirements.
- Design a team logo and work on your team T-shirt and/or trading button.

Pre-Kickoff Preparations

- Research the Kickoff location options through TIMS.
 - Are there workshops?
 - What else is offered?
- Choose a Kickoff(s) to attend and designate your choice by the deadline. Note that allowed attendance numbers vary.
- Choose and designate the method of receiving your KOP by the deadline.
- Make travel arrangements to Kickoff.
- Build the robot crate.

Kickoff – Game is Revealed

- Download the Manual sections.
- Inventory your KOP and report any inconsistencies through TIMS by the deadline.
- Learn the game and immediately begin game brainstorming.

Competition/Event Preparation

- Develop a competition strategy.
- Distribute and collect the *Consent and Release Forms* for each traveling team member.
- Begin work within your sub teams and prototype the robot.
- Test the robot.
- Re-design the robot as necessary.
- Designate pre-college team members as the drive team.
- Pre-inspect your robot, using the sample inspection sheet on the web site.

Robot Shipment

- In January, the Shipping Contact and a back-up person must familiarize themselves with the *Robot Transportation* section of the Manual. Pay particular attention to the donated FedEx shipment area.
- Choose your method for shipping the crate to the initial event drayage facility. There is a choice for the initial shipment, but any subsequent shipments are made through FedEx or the *FIRST* designated carrier.
- Ship your robot by the deadline.

Event Travel

- Review your Team's Credo and the Gracious Professionalism tenets.
- Bring the Consent and Release Forms required for Registration.
- Review travel/ event safety procedures. Use the buddy system.
- Provide the team and parents with contact and hotel information.
- Bring ANSI Z87-approved safety glasses for each team member and team guests. Bring extras

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