



Team Organization Best Practices

FIRST® is a global robotics community that prepares young people for the future.



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Introduction

This guide was initially created by The Compass Alliance and revised by *FIRST*® in collaboration with several *FIRST*® Robotics Competition teams. Thank you to both [The Compass Alliance](#) and the teams who helped to provide feedback to help us create this guide!

This guide is intended to be a foundational resource on Team Organization for all *FIRST* teams. Much of the information and examples provided within this guide are based on concepts from *FIRST* Robotics Competition teams but the concepts can be applied to any *FIRST* team. It focuses on a wide range of ideas and best practices for team organization that are beneficial to both new and established teams. It is up to each team to decide what works best for their specific team.

Team Organization for *FIRST*® Robotics Teams

FIRST Robotics Competition teams are led by adult mentors and students in a variety of leadership positions. Every team's leadership structure may be different, depending on the size of the team and the experience of its members.

Think of your team as a business when setting up roles and leadership. A strong organizational structure will lead your team to success and help reach your goals for the season. Lack thereof will lead to contradictions, confusion, workload overlap, lack of idea sharing, and slow decision making. Develop your team structure and put the proper processes and leadership in place up front. Every team is different and no organization structure is perfect; design the system that's ideal for your team.

It's also important to note that your team organization may change over the years as you try out different styles and as students come and go from your team. Check out the [Team Recruitment Best Practices](#) for some more tips on mentor recruitment, retention, and engagement!

Types of Organization

Subteams

Members of a *FIRST* Robotics Competition team are often organized into subteams with roles or jobs that you might find within a business or organization. These team roles allow students to begin a learning pathway that could lead to a future career. It also might be helpful for a veteran student from each subteam to become the 'lead'. This way, younger students have an older student in charge, along with mentors.

Although every team is different, here are some common subteams:

- Design and Mechanical
- Electrical and Programming
- Business, Media, and Marketing

Teams may also want to reference the [FIRST Robotics Competition Guided Experience Module 1 - Lesson 3](#) which has more information on Subteams and has an activity that students can use to figure out which subteams they have the most interest in.

For teams interested in trying a Subteam based structure, a few starting points might be:

- Define the Subteams your team covers
- Define how members will be put into subteam. You can either:
 - let teams choose their subteam,
 - assign them to a specific subteam, or
 - let students bounce between subteams early in the season until they identify the one that they have the most interest in.
- Consider how leadership will work and who will fill those leadership roles

Specialties

Another model some teams use instead of Subteams is Specialties. This approach may be helpful for smaller teams – around 25 students or so. This structure can allow a team to stay adaptable and support student growth matched to the smaller size of a team. Specialties can offer a few advantages:

- Students can explore multiple areas without feeling locked into one lane.
- Roles can shift naturally between build season and competition season.
- Mentors can support students across Specialties without needing a large mentor to subteam ratio.
- New members can plug in more easily because Specialties feel flexible rather than siloed.
- Students are able to articulate how they've Specialized in multiple things (on resumes, in conversations, etc.) Without having to "bounce" around subteams

Instead of dividing students into fixed subteams (Mechanical, Electrical, Programming, Business, etc.), in a Specialty model, students identify one or more areas they want to grow in. These Specialties can span both engineering and business functions such as:

- Engineering Specialties: Design, Fabrication, Electrical/Pneumatics, Programming, Scouting, Strategy
- Business & Outreach Specialties: Awards, Branding/Media, Financial, Community Engagement

Students can identify their Specialty (or multiple Specialties) early in the year, and mentors then can help guide them toward tasks and training that fit those interests. A key difference from a subteam model is that Specialties are flexible lanes, not rigid silos. Because Specialties aren't siloed, new students can shadow different areas before choosing where they want to contribute, learn, and grow. Pairing them with seasoned students or mentors helps them get meaningful tasks early on. Additionally, Specialties allow leadership to emerge naturally - students learn to lead by example, when they demonstrate initiative and skill, not because a subteam requires a captain.

For teams interested in trying a Specialty based structure, a few starting points might be:

- Define the categories your team covers (e.g., Design, Programming, Awards, Branding, etc.).
- Encourage students to choose a primary Specialty and a secondary they're curious about.
- Allow movement between Specialties as students grow and as seasonal needs shift.
- Use pairing or shadowing to help new students explore before committing.

Organization Charts

Organizational charts, often with job descriptions, can be a helpful way for all teammates to understand their roles and responsibilities. Although every team's leadership structure is different, here is an example of a subteam-focused [organizational chart](#) that a team might use. Teams can use this [editable template](#) (automatically downloads) to alter the organizational chart to fit their needs.

Teams should spend some time thinking about their team and what organizational style makes the most sense for your team. Some teams may structure their team like the organizational chart above or may choose to have a few student captains and lead coaches who oversee the whole team with additional leadership positions available under them. It also may take some time to figure out what works for your team so don't be afraid to try one thing one year and then make adjustments based off feedback from students, parents, and mentors.

Teams may also want to reference the [FIRST Robotics Competition Guided Experience Module 1 - Lesson 4](#) which has more information on Team Organization and communication.

Applications

Some teams may set up an application process and have students fill out required information or go through an application process for them to be considered to join the team. This is typically done when teams have too many interested students and they need to have a method to limit the number of students on the team. Some teams may also have an application process even if every student is accepted so they can have basic information on all team members. This is a great time to collect other information such as parent contact info, other time commitments for the students, T-shirt size, contact info, Allergies, etc., but teams must follow Data Privacy Guidelines about protecting this information.

Teams that typically do an application to limit membership may also require students to do an interview. Interviews can be run by team captains and/or team mentors. Teams who do this approach typically are looking for students who can communicate enthusiasm for the team and clearly have the time to commit to the program. Students who cannot communicate their enthusiasm or are clearly over-committed and can't meet the requirements are typically not accepted. If you choose to do this approach it's recommended that you do the interview process over a couple of weeks and make decisions quickly so you can share with incoming students. It's also recommended that any students who are rejected be encouraged to reapply the following season.

Leadership

It is common practice to elect one or two students as the team captains. These students are responsible to supervise all aspects of the team and to relay messages to the mentors and Lead Coaches. Some teams may also have leads over specific subteams. The leaders communicate with mentors and can be responsible for guiding goals, identifying the steps needed to achieve them, and delegating work within their subteam.

For many teams, students apply for a leadership position. Applications typically include questions that explain why a student would make a suitable lead for each position including:

- Past experience and technical competency
- Proven dedication and contributions to the team
- Demonstration of *FIRST* Core Values and *Gracious Professionalism*®
- Leadership and organizational skills
- Ability to serve as an outstanding representative of the team
- Academic requirements, such as maintaining passing grades in all classes
- Ability to complete the duties required by the position

Many times after the application, mentors/Lead Coaches may choose to interview the students to help dig deeper and to also provide students with interview experience. Based on the application and notes from the interview, the best students for the position can be elected by the mentors, a board of parents, etc. Selecting students for these positions should be based on merit and experience and not to be a popularity competition.

If you choose to have leadership roles, you should be very clear on expectations and responsibilities for each of the roles. Think through things like:

- Is there one leader who is in charge of making decisions for x?
- If you have multiple leaders over the entire team or specific subteams, how are responsibilities shared?
- Who has the final say if leaders disagree?
- Are leaders responsible for delegating work to the team?
- How often do leaders need to check in with mentors?

Communication between your leadership and mentors is crucial. Make sure that leaders meet regularly and understand what other leaders on the team are working on to help avoid confusion and/or duplicate efforts.

Guidelines & Rules

Once your team structure has been formed, the next step is to set up guidelines for the team to follow. These guidelines can be in the form of a team handbook, a team contract, or both. A team handbook typically sets guidelines for the team and any requirements whereas a team contract is in place to have students and parents/guardians sign to acknowledge they understand the rules and responsibilities of joining the team. Some teams may have in addition a separate handbook for mentors to help showcase the expectations of mentors while some may embed this content into their team handbook.

Creating these documents allows mentors and student leaders to set up a team culture, rules, and expectations for the members of the team. The topics covered in these handbooks typically include codes of conduct, team travel policies, participation requirements, meeting schedules, and overall team culture. Follow the links below for examples of team handbooks and team contracts.

- *FIRST* Robotics Competition Team Handbook Examples:
 - [Team 118](#),
 - [Team 254](#),
 - [Team 1678](#) (has both a student and mentor handbook), and
 - [Team 1833](#) (has both a student and mentor handbook)
- *FIRST* Robotics Competition Team Contract Examples:
 - [Team 2910](#), and
 - [Team 5763](#)

Team Communication Tools

Long gone are the days of lengthy email chain threads that would circulate for an entire season. Instead, there are new tools that have become the standard for communicating within a team: Discord, Slack, and Google Apps. In its simplest form, these tools can be used to inform students and mentors of upcoming events and meetings. For more experienced teams, these tools become a platform used to share information, as well as ideas, during the season. Some teams may choose to still use emails (or another method) to communicate with parents on the team.

Disclaimers:

- *Before creating a team account on any of these platforms, teams should also check with their school administration on acceptable means and methods of communication. Communication between students and mentors should follow the [FIRST Youth Protection Program guidelines](#) as well as any school policies. Communication should be used only to exchange information and appropriate material regarding team-related activities.*
- *FIRST does not monitor or moderate third-party platforms like Discord, Slack, or Google Apps. Teams using these tools are responsible for setting expectations around appropriate behavior and ensuring adult supervision of all communications.*

Discord

Discord is an instant messaging and VoIP social platform that allows communication through text messaging, voice calls, video calls, and file sharing. Channels can be created that are specific to a subteam, allowing for easy brainstorming, help from mentors, and collaboration outside of meetings. Roles can be assigned to organize members into their subteams and by other identifiers which the team feels is useful. These roles allow certain members to be notified when that role is tagged rather than the whole team and allows for chats that are specific to a subteam or group of students. Discord add-on bots can also be used to increase the functionality of the platform.

Slack

Slack is a cloud-based instant messaging platform that features apps and integrations with other programs. This platform uses channels to allow for different topics to be discussed. Slack is used in a professional setting with many add on features to enhance the users experience. Keeping your subteams on the same page can be done with slack having a different channel for each subteam that can be viewed by everyone on the team or just the select members in that subteam. Apps or plugins are one of the best features on slack and the list is endless from calendars to taskers to code plug in for your programming team. This will help keep everyone on task and up to date with notifications. A free version of Slack limits the number of messages and amount of file storage available, but teams can expand on their space for a small fee, and there is a discount for nonprofit programs.

Google Apps

Google has a suite of apps that can be helpful for teams. Creating a team Google Drive can be an effective way to share files, collaborate on documents, and keep documentation about each season. Google Classroom can allow for announcements, while Google Calendar can share meeting information and other important dates.

Other Options

Some schools and organizations prefer teams to communicate through particular programs or apps, such as SportsYou or Band. Check with your school to see what communication platforms coaches of other sports at the school are using.

Best Practices for Communication Platforms

1. Assign at least one screened adult (not a minor) to actively monitor team communication channels.
2. Avoid private, one-on-one messaging between adults and youth—use group channels or team forums. This is required to align with our Youth Protection Program guidelines.
3. Clearly define and communicate guidelines for respectful, inclusive, and safe interactions.
4. Provide clear instructions on how to report inappropriate content. Below are reporting resources for commonly used platforms:
 - Discord: Use in-app reporting or the [Trust & Safety form](#).
 - Slack: Report to Workspace Admins/Owners or escalate to Slack via [Report to Slack](#).
 - Google Workspace: Use [Google's Abuse reporting and workspace admin tools](#).
5. Encourage immediate reporting of any concerns or inappropriate behavior using these platform tools.
6. Develop a policy for determining who has access to these team platforms and when individuals are removed after their affiliation with the team ends.
7. Discourage exclusive back channels of communication such as mentor channels that exclude certain coaches or mentors and student-only channels that don't involve mentors and coaches. These can be breeding grounds for team conflict.

Project Management Tools

Project Management is the art of organizing people, tasks, and time to achieve a goal efficiently. It communicates to all involved exactly which tasks need to be completed, by whom, and by what deadline. In *FIRST* Robotics Competition, it can be the difference between a chaotic Build Season and a focused, productive one. Project management helps *FIRST* teams stay on schedule, communicate clearly, and make smart decisions under pressure.

Many project management tools are available to help teams get organized, track tasks and responsibilities, and stay on schedule. No matter which tool or set of tools your team uses, taking the time to get organized early will pay off throughout Build Season.

Here are a few options that teams may consider using:

- **Project management software programs** such as [monday.com](#), [ClickUp](#), and [Trello](#) are used by some teams to coordinate big projects, especially during build season. These programs are used by professionals across many career fields, allowing teams to create project timelines, assign tasks, and communicate with one another.
 - Free or discounted licenses for valuable project management tools are often available for educational use or as part of the Virtual Kit through the Lead Coach Dashboard. Additional details are available on the [Kit of Parts](#) webpage under Virtual Kit.
- **Google Drive:** If your team is already using google products, google drive is a great way to keep files organized and shared with the team. Google Drive allows teams to collaborate on

documents, presentations, spreadsheets, and media and store team documents in the cloud for easy access from anywhere.

- **Scrum/Kanban Boards:** Visual task management tools organize work into columns representing stages of progress, such as "To Do," "In Progress," and "Done." Teams can set this up digitally or simply use a whiteboard and sticky notes to move tasks between stages.
- **Gantt Charts:** Gantt charts are often available within project management software and help showcase visual timelines for milestones on your team.
 - This spreadsheet-based [detailed Gantt chart template](#) (automatically downloads) allows teams to easily set start and end dates, assign tasks, and track progress for each task. Once it is set up, it can be used and modified year after year.

Additional Resources

- [FIRST Team Management Resources](#) - A collection of resources to help teams with some of the aspects of running a team such as organizing your team, fundraising, and more.
- **FIRST Robotics Competition Guided Experience**
 - [Module 1: Intro to FIRST Robotics Competition](#) – This module helps participants learn more about FIRST Robotics Competition teams, games, competitions, resources, and more.
 - [Module 10: Business, Awards, Marketing, and Media](#) – This module focuses on these Business, Marketing, and Media skills, including team operations, logistics, award preparation, photography and videography, graphic design, writing, social media, animation, finance, and more
- [Effective Student Leadership Development with FIRST Robotics Competition Team 1678, Citrus Circuits](#) - What era are you in? This presentation from Mike Corsetto covers strong examples of cultivating student leadership over many years. Watch this presentation to learn why to invest in student leaders and find key principles for developing leadership skills