VEX Robotics Competition Team Organization Guide

Start Your Team

Please visit robotevents.com to register your team and find events in your area. Please refer to our guide on starting teams that details the process to register, purchase VEX equipment, and locate and register for a local VEX Robotics Competition near you.

Plan Your Schedule

How often will your team meet and where? How long is it until you compete? What is the best time for your team to get together? If your team is asking these questions you are asking the right ones. The VEX Robotics Design System is ideal no matter what your time constraints and level of expertise are. Some teams meet once or twice per week for just a few hours, while others meet longer. What does it take to be successful? It really comes down to matching your time, resources, and expertise to an effective design and game strategy that are appropriate for your team.

Holding Effective & Efficient Meetings

Celebration and fun should exist alongside design work for your team. Design can be difficult and almost never goes as planned, especially in early iterations. Always treat a "failed" test as an opportunity to learn and try to make sure all team members walk away with something positive each time you meet. Learning key interpersonal skills and perseverance is every bit as important as any engineering, programming, or design knowledge gained by students on your team.

Managing, and Storing VEX equipment

Vexrobotics.com is the home for all of your VEX equipment needs. Organizing your VEX workspace and helping student teams manage their VEX creations and equipment is an absolute must for maximizing build time. Refer to our guide on starting teams for further information on what VEX equipment will meet your team's needs. Be sure to follow instructions included with your rechargeable batteries to maximize life and performance. Once your VEX equipment is unpackaged for the first time, you'll need to store and care for it. Each situation is different and knowing your own space, storage needs, and set-up is paramount. You'll also have to keep in mind how much of your equipment will need to be portable for competition. There are a lot of affordable storage solutions that include toolboxes, plastic containers of all sizes, compartment storage for small parts, and other items that combine these characteristics. The idea is to make choices that allow your team to stay organized each and every day.

What Else Does a Team Need?

Other than your VEX equipment and your team members, it's a great idea (but not mandatory) to have extra wrenches, tethers and extra rechargeable battery packs for competition if your team budget allows for it. A few basic hand tools, like tin snips, a hacksaw and a metal file for sharp edges are good to have handy as well. Be sure everyone is wearing safety glasses while working on the robot and at competition. It's best to do your programming work using a laptop you can take to competition with you, as it will save a lot of headaches in the end.

Please see the competition manual for programming specifics and our programming page for software choices at vexrobotics.com/vex-robotics-programming-kit.shtml if you don't already have a programming package for your team. You will also want to be able to practice with your robot, so your team will want to have at least a few game elements and field components to test out it's designs. Actual game elements and field components are available though the vexrobotics.com competition tab and low cost options to meet any team's budget are also outlined there.

Team Identity

Many teams attend competitions wearing team shirts and bearing trinkets or giveaway items to share with their fellow competitors. Pit spaces at competitions are also places where you see team banners, posters, and sometimes documentation that a team used in its design process. While none of these items are "must haves" they often pay great dividends for a team in its own community and school, not just at competition. As your team grows over the years, consider building a team identity and presence through a name (to go with your team number), a shirt or "uniform" of some kind, and add in the other pieces when your team has the ability to do so. The more you celebrate your team's efforts and learning this way, the easier it will be to engage other teams, event personnel, and event judges as well as potential supporters at home that will help you build your team's robotics program.

Brainstorming

Once your teams learns about the VEX Robotics Competition game for the year, it will be very excited to get at building a robot to play! However, we encourage your team to develop and utilize a brainstorming process first so that no ideas are left un-discussed. If you set out too quickly just to build, you may miss out on a winning strategy and design idea. It's important for your team members to understand the game, then use some sort of system to brainstorm so that your team decides "what" it wants to do before it decides on the details of "how" to do it. There are literally hundreds of brainstorming processes/systems floating all over the web. One simple way to brainstorm is to have the team list all of its strategies and design ideas then categorize them by "need, want, and wish." Thus if your team only has time to accomplish its "needs" by the time competition rolls around, it will still be able to be competitive. However, you'll also have a list of "wants" and "wishes" to move on to if time allows. Remember, this is only one of many viable brainstorm processes your team could use. We suggest investigating several and choosing one that meets the unique needs of your team.

Build, Test, Iterate

The great thing about the VEX Robotics Design System is having the ability to build, test, and iterate to improve a design in rather rapid fashion. No matter how good any design idea and plan is, there's no "proof" of anything until you actually build and test your idea. Many great designs in our world took many, many attempts to perfect. Design is indeed an iterative process, so embrace that notion and keep going until your robot system or mechanism yields the expected, repeatable behavior your team desires. We would also suggest that while iterating, make only one change at a time and keep documenting your results. While this may seem overly burdensome, think about it. If your team makes more than one change and you get things to work right, you still probably won't know "why" you achieved the desired result. When testing new programming code, always save your new code under a new filename. These files are small and take up almost no hard drive space, so develop a naming system and stick with it throughout. You never know when something won't work and you'll regret having to recreate something that already worked well.

Document the Process

Successful engineering in the "real world" includes effective and efficient communication. Documentation of the design process is a critical element in the lives of nearly every practicing engineer and scientist. While this isn't mandatory at all, please consider having your team members document the design process. This can be a great tool to aid in decision-making and, over time, will depict the journey taken and growth of your team. One simple method is to use a notebook with handwritten entries that outline an ongoing design cycle of idea/need identification, task(s) to complete, and assessment/evaluation through testing. Such a notebook is also a great place for sketches, pictures, and calculations. Again, there are hundreds of documentation models out there, so investigate and choose based on what fits your team.

Divide Responsibilities

This may seem like an obvious piece of team organization, but how often do we all encounter work or team situations where responsibilities are portioned out in ways that are simply ineffective? Some teams may be able to divide responsibilities based upon expertise (programming, mechanical design, strategy, rules/inspection checklist, etc) while others might split things up according to robots systems (drive, manipulator, etc). Keep in mind that there are essentially two sets of responsibilities your team will encounter – one set during the build phase and one set at competition. While these two sets are related in some ways each carries some unique characteristics as well. Again, only your team knows its membership so consider what is most effective for your team and always remember flexibility is a key element to success. You never know when someone on the team needs help or support and someone else needs to step in to help with a deadline. Many top teams help "fill in the gaps" this way seamlessly, working together to achieve a goal with no placement of blame.

Getting Ready for Competition

After your team has completed the robot build and programming (following all game rules and guidelines carefully), and has practiced with the robot, it will be time to get ready for competition. Your team should ready itself for robot inspection at competition by reviewing the guidelines and running through the inspection checklist about a week before competition so there is ample time for adjustments as necessary. It's also a good idea to review your tournament structure, the alliance selection process, and to be prepared to collect information on other teams at the event – typically called "scouting" – to assist with strategizing for each match. It's a good idea to pack for your event before your day of departure. Most competition days start early and it's easy to miss something while you're in a rush. Consult your local event organizer for details, but you can count on most events providing you with table space and one electrical connection in your team's pit area. Minimally, be sure to pack a multi-plug power strip, batteries, one or two tethers (phone cables for each transmitter/driver), your robot, spare/extra parts, tools, laptop for programming, and a lot of enthusiasm. Remember banners, notebooks, and giveaways if you have them.

What to Expect at Your Event(s)

Arrive a few minutes early if possible and make sure your team is well rested, is hydrated and stays that way. Consult your local event organizers for exactly how your event will be run, but a typical event begins with team registration, robot inspection, and practice matches. Although your team will be very busy at events, don't forget this is a great place to network with teams and the friendly event personnel. Chances are you can help each other in many ways. The day will continue with a drivers/coaches meeting followed by actual match play, alliance selections, and finals. If you have any questions ask the event staff and/or other teams. You are not in this venture alone. The competitive robotics community is a collaborative one and you might be surprised at the blend of fierce competition and cooperation.

Using Resources

Please consult our one page resources listing and the vexrobotics.com website for all of your team needs. Please know your entire experience as a VEX Robotics Competition team is fully supported by the VEX Robotics staff, event organizers and volunteers, and your fellow teams. Please utilize the resources and ask questions as often as you need to. Lastly, thank you for your involvement. By being part of the VEX Robotics Competition you are helping students meet their own goals and grow in very dynamic ways that will surely affect the future in a myriad of positive ways.