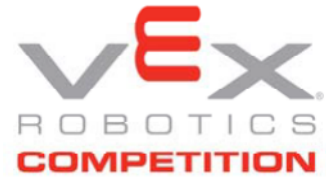




How to Start and Organize A VEX Robotics Team



This document has been created to help new teams get started with the VEX Robotics Competition. If after reading this document, your team still has questions about getting started, please feel free to visit www.robotevents.com for more information or contact your local Regional Support Manager.

Getting Started

Congratulations on making the decision to join the VEX Robotics Competition, a fun, dynamic, and competitive learning environment. There are several websites that your team should visit in order to get started.

Register your team: www.robotevents.com

Visit robotevents.com and choose the *VEX Robotics Competition Event Info & Registration* button for *Middle/High School*. Follow on-screen instructions to register your team for only \$75 for the first team number at a school/organization and \$25 for each additional suffix. Once payment is received, teams will receive a Welcome Kit that includes the sample game elements (for the first team only), team license plates, and flags. If you are registering a college team, please remember to choose the “College” button.

Review the VEX robot kits & parts: www.vexrobotics.com

Learn about the current game, Sack Attack: http://www.vexforum.com/wiki/index.php/Sack_Attack

Find events near your team: <http://www.robotevents.com>

Communicate and Collaborate with the VEX Community: www.vexforum.com

Review the various game documents: http://www.vexforum.com/wiki/index.php/Sack_Attack

Plan Your Schedule

In order for your team to be effective, the team will want to develop a schedule and stick to it. The VEX Robotics Design System is ideal no matter what your time constraints are and your team’s level of expertise. Here are some questions that your team should answer during one of your first meetings. – How often will your team meet and where? How much time do you have before your first competition? Some teams meet once or twice per week for a few hours, while others will meet more frequently and for longer periods of time.

Plan The Team Meetings

Celebration and fun should exist alongside design work for your team. However, it is really important that teams structure their meetings and develop project timelines. During your first or second meeting, it is highly suggested that the team develop a list of specific goals with deadlines. Record these goals and deadlines and assign someone on the team to keep track of the team's progress.

Assign Team Roles

VRC teams vary in size. While some teams start out small, they often grow over the years. In order for your team to be productive, it is important to assign everyone on the team a job. Here are some of the various roles that students can hold. Note: It is not essential that every team have someone in every single role listed below.

- Advertising and Public Relations Captains
- Builders
- Handout Developers
- Drive Team Builders
- Fundraisers
- On-line Challenge Members
- Pit Team Member
- Programmers
- Team Coach
- Team Identity Developer(s)
- Team Scout(s)
- T-shirt Designer
- Videographer
- Web Designer

Develop A 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 places where teams can hang banners, posters, and even documentation of their design and development processes. While none of these items are "must haves," these items often pay great dividends for a team in its own community and school. As your team grows over the year(s), consider building a team identity and presence through a name (to go with your team number) and a shirt or "uniform" of some kind, and then add in the other pieces when your team has the ability to do so. The more you celebrate your team's efforts and accomplishments, the easier it will be to engage other teams, event personnel, and event judges as well as potential supporters that will help you build your team's robotics program.

Purchase, Store and Manage Your VEX Equipment

VEXRobotics.com is the home for all of your VEX equipment needs. Please remember that robots can only be built with official VEX products. Please consult the game manual for exact rules about robot parts and equipment.

Once your VEX equipment is unpackaged for the first time, you will need to store and care for it. Organizing your VEX materials and workspace will greatly enhance your team's productivity. There are a lot of affordable storage solutions that include toolboxes, plastic containers of all sizes, and storage bins with compartments for small parts that will allow your team to stay organized each and every day. Each situation is different and knowing your own space, storage needs, and set-up is paramount. You will also have to keep in mind how much of your equipment will need to be portable

for competitions as you make storage decisions.

Assemble An Adequate Tool Kit

Other than your VEX robot kit and your team members, it's a great idea (but not mandatory) to have extra wrenches, tethers, rechargeable battery packs, and other spare parts, 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 a good to have handy as well. Always be sure that everyone wears safety glasses while working on the robot and during competition matches.

Brainstorm

After your team members learn about the VRC challenge for the year, they will be very excited to start building a robot! However, we encourage your team to develop and utilize a brainstorming process before building so that no ideas are left un-discussed. If your team begins the building process too soon, an effective strategy and design idea may be missed.

There are literally hundreds of brainstorming processes/systems. One simple way to brainstorm is to have the team list all of its strategies and design ideas and then categorize them by "need, want, and wish." Thus, if your team only has time to accomplish its "needs" by the time a competition rolls around, it will still be able to be competitive. Then as time allows, your team can get to the list of "wants" and "wishes" as time allows. Remember, this is only one of many viable brainstorm processes a team can use.

In order to maximize the brainstorming process, teams can use mind mapping software such as [FreeMind](#). Investigate several brainstorming processes and choose one that meets the unique needs of the team.

If there are team members who have never built a robot before, it might be a good idea to have them review the [Inventor's Guide](#).

Build Your Competition Robot

After adequate brainstorming and research, the time will come to actually build a competition robot. Here are a few last things that a team might want to consider before starting the process.

Follow All Game Rules as outlined in the official game manual.

Ask Questions About Rules in the official game Q&A forum. Forum registration is free.

Ask Technical Questions at vexforum.com. Some answers may already be there.

Robotics Experience is Not Necessary A supportive community is ready to assist.

Document the Build Process: Maintain An Engineering Notebook

Successful engineering in the "real world" includes effective and efficient communication and documentation. Documentation of the design process is a critical element in the lives of nearly every

practicing engineer and scientist. While this document isn't mandatory in VRC, please consider having team members document the design process. This can be a great tool to aid decision-making and, over time, will depict the team's journey and development of ideas. One simple method is to use a notebook with handwritten entries that outline the ongoing design cycle of idea/need identification, task(s) to complete, and assessment/evaluation through testing. This Engineering Notebook is also a great place for sketches, pictures, and calculations. Again, there are hundreds of documentation models out there, so investigate and choose the one that fits your team.

One of the main missions of the VEX Robotics Competition is to help students acquire real world life skills that will benefit them in their academic and professional future. The Engineering Notebook is a way for teams to document how the VEX Robotics Competition experience has helped them to better understand the engineering design process while also practicing a variety of critical life skills including project management, time management, brainstorming and teamwork. The Engineering Notebook requirement of the Design Award has no specified format; each notebook should be created through a concerted effort by a team to document their design decisions. Throughout the season, many larger events will send their Design Award winner to World Championship, and as a result, teams should start their notebooks early and update them often.

Test & Iterate

One great thing about the VEX Robotics Design System is having the ability to build, test, and iterate a design in a rather rapid fashion. Many great designs in our world took many, many attempts to perfect. While iterating, encourage team members to make only one change at a time and document the impact of the change. While this may seem overly burdensome, it is the best process to document design changes and their results. Design is an iterative process, so embrace the notion and keep going until the team's robot system or mechanism yields the expected, repeatable behavior desired.

When testing new programming code, always save new code under a new filename. Programming 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.

It is also important to remember that the design and programming phases can be difficult and these processes almost never go as planned, especially in earlier iterations. Always treat a "failed" design 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.

Evaluate Robot Programming Options

In order to program your robot, your team will need to choose a programming software package. Please see the competition manual for programming specifics. Software choices can be found at vexrobotics.com/vex-robotics-programming-kit.shtml. If your team does not already have a programming package, read the postings in the VEXForum.com about the available software packages. Here are links to two different programming options.

[easyC](#) (intelitek) [Online Tutorial](#) and [Demo](#)

[RobotC](#) (Carnegie Mellon University)

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. Here are a few critical steps that your team will want to complete to be ready for competition.

1. Review the rules and run through the inspection checklist about a week before competition so there is ample time for adjustments.
2. Check the official VEX forums for rule updates and changes.
3. Visit the tournament's page on RobotEvents and read it carefully. Specifically look for details about your team's pit area, available concession areas, electrical sources, and any venue specific rules.
4. Pack for the event the day before the day of departure. Most competition days start early and it's easy to miss something when in a rush. Here are some items that the team will definitely need:
 - a. Goggles
 - b. Spare parts & tools
 - c. Batteries and chargers
 - d. Programming cable
 - e. Laptop computer
 - f. Engineering notebook
 - g. Banners and other decorations for your team pit
 - h. Giveaways if you have them
5. Be sure to read [101 Things You Should Know Before Your First VEX Tournament](#)
6. Review the descriptions and criteria for the awards that are being given during the tournament.
7. Prepare to answer questions from the judges.

What to Expect at Event(s)

A typical one-day tournament will most likely have an agenda like the following.

7:30 AM - Doors Open, Practice Fields Open
8:00 AM - Concession Stand Opens
8:00 AM – 9:00 Check-In / Inspection
9:15 AM – Drivers and Coaches Meeting
9:30 AM – Opening Ceremony
9:30 AM – 12:00 PM - Qualification Rounds
12:00 PM – 1:00 PM - Lunch (limited offerings)
12:00 - 1:00PM - Robot Skill Challenge and Programming Skills Challenge
1:00 PM – 2:30 PM - Complete Qualification Rounds
2:45 PM – 3:15 PM Alliance Selection
3:15 PM – 3:30 PM Alliance Strategy Meeting
3:30 PM – 5:00 PM Alliance Elimination matches
5:00 PM – Awards and Closing Ceremony

Tournaments are busy, fast-moving days. Here are few tips for success.

- Make sure your team is well rested.
- Arrive a few minutes early, if possible.
- Drink plenty of water to stay hydrated.
- Review the agenda as soon as the team arrives onsite.

- Pay attention to the match schedule.
- Don't forget to use the tournament as an opportunity to network with teams and the friendly event personnel.

Celebrate Your Hard Work

After each competition, find a way to celebrate the team's accomplishments. Whether you take home the Excellence Award or not, your team is worthy of celebration time. Consider inviting some of your sponsors, teachers, and community members to an after tournament dinner. This would be a great opportunity to talk about what you learned and how you will prepare for the next competition.

Using Resources

Please know your entire experience as a VEX Robotics Competition team is fully supported by the VEX Robotics staff, the Robotics Education and Competition Foundation staff, event organizers, volunteers, and your fellow teams. Please utilize the resources and ask questions as needed.

1. Review information from VEX officials, community member on the [VEX Forum](#)
2. Read about the VRC Competition awards by reading the [Awards Appendix](#).
3. Download the VEX Robotics app so that you can easily read and search the Sack Attack game manual.

Online Challenges: Get Everyone Involved

The VEX Robotics Online Challenges are another great component of the VEX Robotics Competition. These challenges are free and provide additional opportunities for students to become involved with the program.

There are seven online challenges for teams to be involved with this season. The challenges include the Autodesk Sustainable Design Challenge, FUTURE Foundation Build Challenge, VEX Robotics Essay Challenge, RECF Educational Video Challenge, EMC Team/ Club Website Challenge, VRC Game Design Animation Challenge, and the VRC Promote Challenge.

Additional information about these challenges can be found at: <http://forum.robotevents.com/design> - <http://forum.robotevents.com/design/%20%20%20>

Other General Tips:

- It is best to do your programming work on a laptop you can take to competitions with you.
- Be sure to practice the game with the practice elements that are sent to your team in the Team Welcome Kit. Additional game elements can be purchased through www.vexrobotics.com.
- Safety comes first. Always wear goggles when working on your robot and while competing. It is also a good idea to have an adult present when power tools are being used.

Have Fun & Good Luck!