



Special Olympics Unified Robotics Season Guidebook

WASHINGTON

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Special Olympics
Washington
Unified Robotics



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INTRODUCTION

Special Olympics® Unified Robotics™ is an inclusive robotics program open to students with a variety of learning levels, bringing the world of STEM and robotics to high school students with special needs during a 6-week after school program.

Special Olympics Unified Robotics™ exposes engineering, programming and robotics to students with learning disabilities and behavioral challenges and fosters a neurodiverse work environment promoting social inclusion. Students from the general education population, often from a robotics team, work alongside students with intellectual disabilities and/or autism in one-to-one partnerships to build robots in small teams ranging from two (2) to six (6) students using kits made by LEGO®. Each team designs, builds, and programs their own robot during a six (6) week period¹. At the Championship, each team presents their robot and its features to judges, then competes in a tournament-style competition.

The purpose of the Special Olympics Unified Robotics Guidebook is to provide the tools to start a team and participate with other schools with the same mission, rules, and involvement. This guidebook will update frequently, so please check back on for the most up-to-date version.

TERMINOLOGY

"Partners" involved in a *FIRST*® team, or in the general education population, work alongside "athletes," students from the special education population. A Unified Robotics coach, who may be a *FIRST*® team coach, special education teacher, parent, or other supervising adult attends the club meetings; however, the program is developed to be 100% student-led. Therefore, the adult advisor does not need to have a background in robotics. The school's special education teachers play a crucial role in generating awareness and encouraging students to join. If your school already has a Unified Sports® program through Special Olympics, the Unified Sports liaison will also assist you.

CREATING THE CLUB

It is advised to notify necessary school staff regarding this program, including, but not limited to, the special education coordinator/teacher, school principal, school ASB club, and yearbook staff (if you are planning to add the club to your school's yearbook).

Since the Unified Robotics season starts in September, we recommend that the staff is notified during the springtime for planning, and to publicize that your school is participating

¹ A Unified Robotics season may vary in length and start time. Factors that affect the season timeline include interrupting holidays and conflicting season timelines of *FIRST*® programs.

in a Special Olympics Unified Robotics™ Club in course overview packets. Generally, the steps to create a club are the following:

1. Contact your club advisor. An example includes a special education lead teacher.
2. Follow school guidelines regarding creating a club.
3. Register online at <http://unifiedrobotics.org/register>.

Check your school's club policies for a more accurate process.

MATERIALS

Kits and Software

Teams of two (2) to six (6) students will be working together with LEGO® MINDSTORMS® EV3 Education Core Kits throughout the season. Although any version of MINDSTORMS NXT Kits are acceptable, we recommend using EV3 kits because the LEGO Group is providing support for newer models. Each team requires the use of one (1) Core Kit, each costing around \$379.95. The total quantity of Core Kits varies depending on the number of teams in the club. It is **optional** for the club to purchase one (1) MINDSTORMS EV3 Expansion Kits per 3 teams, for extra and additional parts. Each Expansion Kit costs \$99.95.

You are able to purchase [Core Kits](#) and purchase [Expansion Kits](#) at the LEGO Education website.

Each team requires at least one (1) computer to use the MINDSTORMS Programming Software. Programming the robot requires a laptop or desktop computer running the latest version of Microsoft Windows or MacOS with the MINDSTORMS EV3 Programming Software. The purchaser of the MINDSTORMS Kits receives download and installation instructions, and can install and run the software on Team computers.

Space and Time

It is recommended that the space has one (1) table per team to have enough to accommodate a computer, their MINDSTORMS Kit, and their robot. It is ideal to be in a quiet and distraction-free environment.

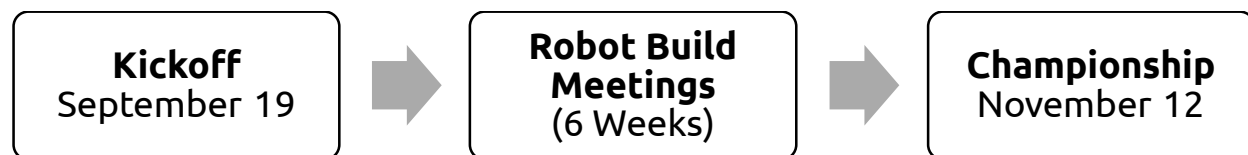
The pacing of the build time depends on the individual students. Partners should not rush the athlete, or take over the building process. Meetings generally are 60-90 minutes once a week, depending on the schedule, pacing, and consensus of team leaders.

People and Creating Teams

Student leads should work with the special education teacher in their school to organize teams in advance based on students' individual skills. There should be a ratio of one (1) partner per one (1) or two (2) athletes. Teams should not exceed a combined total of six (6)

students. Partnerships should be based on student pacing—students with vastly different pacing may affect the interest and enthusiasm of the team.

TIMELINE



Special Olympics Unified Robotics™ is approximately six (6) weeks long consisting of one (1) kickoff meeting, one (1) build meeting per week, starting in September and ending in mid-November, and culminating in a Championship Tournament. Each meeting typically lasts 60-90 minutes, however, meeting times and days may vary, depending on student and coach availability.

Note: If you start a Unified Robotics™ team within a few weeks after the official kickoff, you are still able to participate and compete in the season's championship tournament as long as the team has registered before the cutoff, met a minimum of four (4) building days and has a complete robot.

The kickoff meeting is a social and introductory meeting where everyone in the club gets to know each other and is informed of the logistics of meetings and the timeline of the season.

The introduction to the club should include the following:

- Icebreaker
- Club mission and roles of everyone involved
- Distribution of Special Olympics Washington Paperwork to be completed and submitted by second week
- Distribute schedule of the season, including the Meetings and the Championship
- Demonstration and introduction to LEGO® MINDSTORMS® robot kits, including the MINDSTORMS® Brick, key parts, and mechanisms
- Establish Team Names and Team Cheers
- Some time to allow students to see and play

After the kickoff meeting, teammates will work together to build and program a MINDSTORMS® robot, either through the provided instruction manual in their kit or through a design the team develops. This part of the season can last four (4) to six (6) weeks depending on club size and schedule. After their robot has been built, teams will program their robot with software provided by the LEGO® Group, and will continuously test and refine their designs and program to develop a well-tested and structurally sound robot.

During the last two (2) weeks of Robot Build Meetings, students will also practice presenting their robot, which includes the following:

- An introduction of the Team, along with an explanation of how their robot works.
- The Design, Build, and Programming process.
- The season's game, with Main Objective and basic rules.
- Practicing sample questions that a judge might ask them at the Championship

During this time, teams test and refine their robot on a game field.

The last week of the Season includes the tournament. As schools within a region form teams, they will compete in an interschool competition. Until such a time, each school is encouraged to hold a tournament in your school during which the teams from that school can showcase their robots and compete against each other, perhaps during a school assembly or other special gathering of the student body.

The Championship Tournament begins with an Opening Ceremony, highlighting the participants and supporters of the program. Teams may give their presentations to the audience with the points described above. All teams will be competing in a Double-Elimination Tournament with the Game established in the beginning of the Season. During this time, Judges will determine teams who receive awards based on their conversations with each team and the criteria required to qualify. Officials are provided for each competition.

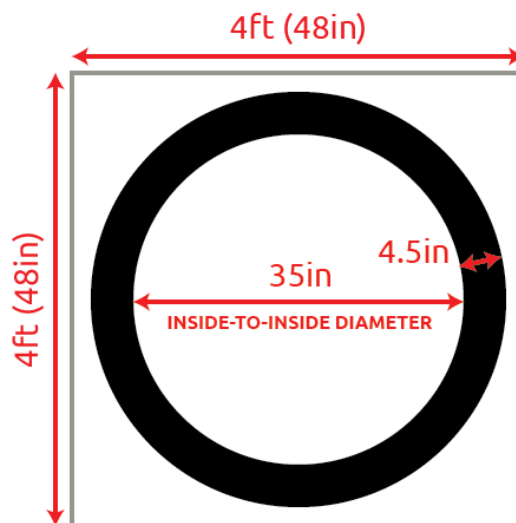
Planning the Championship

The Championship should be a well-thought-out event in which generates interest from the community and other schools. Be sure to spread the word and get the local community excited about the Unified Robotics™ program through flyers, blog posts, social media, word of mouth, and school bulletins.

It is very important to plan the event at least a few weeks in advance to reserve the venue (i.e. school auditorium/gym) and to invite the public to attend. Medals and ribbons are provided to 1st – 8th place finishers – participant ribbons are provided to teams who competed but did not finish. It is ideal to have an Emcee/Game Announcer and a referee at the event.

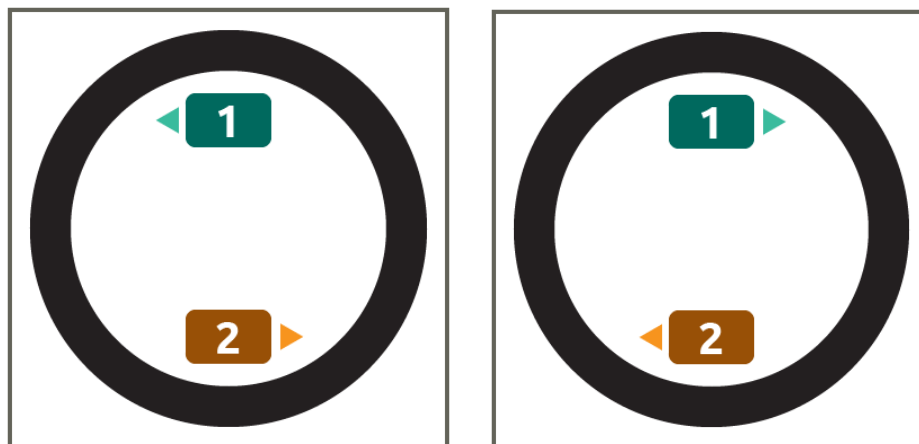
GAME AND TOURNAMENT

Teams compete together in a friendlier version of 'Battle Bots.' Two (2) teams, against each other, compete in a four (4) foot by four (4) foot field with a 4.5-inch-thick black circle, thirty-five (35) inches inside-to-inside diameter. The objective of this game is to push the opponent's robot outside of the black circle, in order for that robot to be called "out." The robot that stays within the ring the longest wins.



Game Rules

1. Teams are not allowed to touch the robot at any time during the match, unless requested by the Referee.
2. Referees are allowed to restart a match if robots do not move each other or are locked together and not making progress toward the edge for more than fifteen (15) seconds.
 - An example would include both robots getting caught with each other and continuously spinning without any progress moving to the ring.
3. Teams are required to be at least eighteen (18) inches away from the field.
4. The first team called up for a match gets to choose the order for placing the robots.
5. A robot wins by pushing more than half of their opponent's robot out of the ring.
6. If the robot has long attachments, the Referee will make the judgment based on the main part of the robot.
7. The robots start the match on opposite sides of the ring, facing opposite directions. Both robots should be inside the ring, close to the edge, either facing in a clockwise or counter-clockwise direction.



Awards

Each event is required to have judged awards for teams to achieve. Awards include, but are not limited to:

- **First Place:** A Special Olympics Unified Sports Gold Medal is presented to the team who earned first (1st) place in the tournament.
- **Second Place:** A Special Olympics Unified Sports Silver Medal is presented to the team who earned second (2nd) place in the tournament.
- **Third Place:** A Special Olympics Unified Sports Bronze Medal is presented to the team who earned third (3rd) place in the tournament.
- **4th – 8th Place:** Ribbons are presented to the teams who earned fourth (4th) to eighth (8th) place in the tournament.
- **Best Spirit:** This award is presented to the team who celebrates extraordinary enthusiasm and spirit through exceptional partnership and teamwork.
- **Best Design:** This award is presented to the team who designs and develops a mechanically sound robot that is durable and efficient.
- **Best Program:** This award is presented to the team who utilizes outstanding programming principles, including clear and concise code that allows their robot to perform autonomously and consistently.
- **Most Creative Design:** This award is presented to the team who designs and develops a mechanically sound robot that is exceptionally unique.

For onsite school competitions, your club will make, procure, or purchase ribbons and awards, as well as Certificates for Judged Awards, including the Award Title and the Description of the Award.

One possibility for trophies is to create small 3-D Printed trophies for every participant of the Club. The trophy must include the Special Olympics Unified Robotics™ Logo, and all should be printed before the start of the event. (Be sure to plan ample time for this). Please see the Unified Robotics website for available logos to download.

TIPS AND ADVICE

- Find out if there are Unified Sports at your school. If so, connect your Athletic Director to the Robotics Teacher and begin working together to start a team.
- **Connect** with your region's Special Olympics director.
- Reach out to your community through local newspapers, social media, or other outlets to notify them about upcoming events and get them excited about Special Olympics Unified Robotics™.
- Keep parents involved every step of the way, so they can be inspired by what they see and help the program grow by spreading word to friends and coworkers.
- Learn respectful vocabulary, such as mentioning the student as a "student with special needs." The disability goes after the subject. The student should not be mentioned as a "kid." Never describe someone by his/her disability (e.g. an "autistic student").
- **Never** call the student "retarded," a "retard," or "a student with mental retardation." Use of these terms can hurt millions with intellectual disabilities, including their families and friends. Take the pledge to eliminate the use of the "R-Word" in everyday speech at <http://www.r-word.org>.
- Keep in social contact with the students before, during, after the season, and throughout the school year. You've made new friends!
- Take the Disability Awareness training through Special Olympics before you begin training.
- Read Article 1 of the Special Olympics general rules.
- Focus on each individual's abilities, not their disabilities.
- Partners and coach can meet with the special education teacher for a brief training session to gain confidence in working with students they may not yet be familiar with.
- Partners work with the students at individualized paces, and must work together at an equal level. This is a hands-on activity for all, so partners are highly discouraged from taking over or doing all of the work.
- To encourage appropriate school behavior, refrain from hugging the student. High-five them instead.
- Communicate to students that no experience is necessary to join the club, that the student works at his/her own pace, and that the club is a fun, hands-on, and competitive learning experience.
- Encourage students to come to the first meeting to have a feel for the club, especially when the student is hesitant to join. Almost all the time, students join the club by the end of the first meeting.
- Students are often hungry after a long day. Bringing snacks and beverages for the entire team to share is encouraged. Bring a sheet to the first meeting and/or email parents, allowing them to sign up for bringing snacks.

- T-Shirts are a great way to encourage Special Olympics Unified Robotics™ spirit. Have teams vote if they are willing to purchase a team shirt for \$10-\$12 each. Find a local printer to print shirts
- Schools near each other can join together to share resources (e.g. workspace, partner students, etc.). Special Olympics Unified Robotics™ is all about helping one another. Gracious Professionalism® and Coopertition™ is evident in all Special Olympics Unified Robotics™ events.
- Non-robotics team students can be taught how to become a partner to assist their school's *FIRST*® Team. This is highly encouraged to promote school Unity.
- *FIRST*® Team Members should consider joining their school's Unity Club and participating in other Special Olympics Unified Sports.

RESOURCES

Check the Unified Robotics website for a list of resources you can access.

CONTACT

Consulting Mentor and Student Leads

- Noelle Foster (Consulting Mentor): nfoster@unifiedrobotics.org
- Andrew LaPrade (Student Lead): alaprade@unifiedrobotics.org
- Laurie Machida (Student Lead): lmachida@unifiedrobotics.org

Special Olympics® Washington

- Morgan Larche (Director of Unified Schools): mlarche@sowa.org

GLOSSARY

- **Partner:** A student or adult without an intellectual disability, typically from the general education population.
- **Special Education Teacher:** A staff member of the school where the Special Olympics Unified Robotics™ Club is held. He/she can be a head teacher, manager, or classroom aide.
- **Athlete:** A student with an intellectual disability or autism, typically from the special education population.
- **Unified Robotics Coach:** Can be a teacher, parent, or adult that supervises the school's Unified Robotics club. The Coach must fill out any forms that are requested by us or Special Olympics Washington.
- **Unified Sports®:** A Special Olympics program where students with and without disabilities join together on the field of play with an equal number of special education and general education students.