



Unified Robotics

2021 Game Rules

Game Description

Teams compete together in a friendly version of a sumo wrestling style 'Battle Bot' contest. Two teams compete in a three foot diameter ring with the objective of pushing the opponent robot out of the ring. The ring is defined as the inner white region bounded by a 4.5 inch black circle. The black circle is considered out. A robot is considered "out" and has lost the match when more than half of the main body of the robot has been pushed onto the black ring.

Game Philosophy

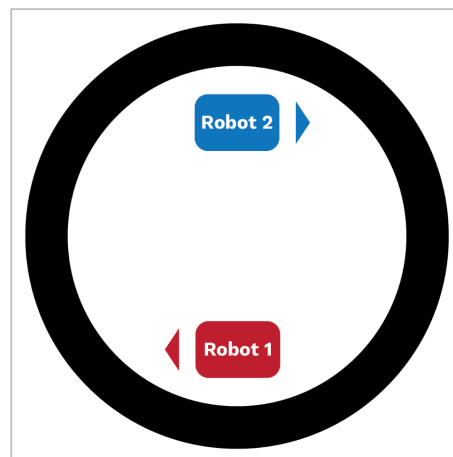
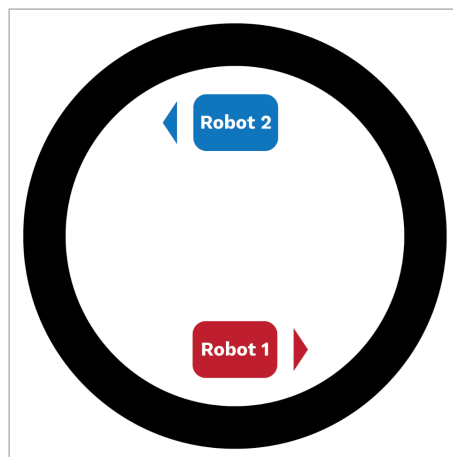
The primary goal is for the students to be engaged, challenged, and have fun. While we want to create an even and equitable playing field and experience, we need to understand that many of the students have varying levels of intellectual, physical and social disabilities. As such we need to be flexible and accommodating with the rules. When in doubt, err on the side of accommodation and grace.

Robot Rules

- For the 2021 season, Unified Robotics will continue using the LEGO Mindstorms EV3 robotics kits.
 - For 2022, Unified Robotics will use the new Spike Prime kits.
 - Special Olympics Washington (SOWA) and Unified Robotics can assist teams with LEGO kits and supplies as needed.
- The following robot rules are in place to offer a fun and fair competition among all teams, and attempt to best create equity among teams with different numbers of members, budgets, etc. At the competition, robots will be visually inspected to meet the basic motor and size restrictions. Our goal is to make sure all teams are able to play, with fairness in mind.
- One base kit with one expansion pack is acceptable, so long as the robot meets all other listed rules.
 - Base kit is the Educational version, containing the Ultrasonic sensor (not the Infrared sensor)
 - Expansion Kit should only be used when a school or organization has multiple teams, and needs a few additional components for all teams to build.
 - Decorations and other small pieces from other Lego products are fine - have fun and make your robot your own. Decorations should not significantly change the size or mass of your robot.
- No more than two Large motors may be used for propulsion.
 - A third large motor may be used for decoration, or added functionality. This does not include driving a wheel contacting the floor.
- No more than three Large motors per robot.
- When sitting in its playing position, the robot should fit within an 8.5" x 8.5" square.
 - Small/flexible parts that extend beyond the size parameter, like axles or cables, are acceptable.

Match Setup/Start

- Robots start the match on opposite sides of the ring, facing opposite directions. Both robots must be inside the ring, close to the edge.
- The team designated 'red' by the match schedule chooses the starting placement and orientation (facing in either a clockwise or counter-clockwise direction). The second, 'blue' robot must be placed on the opposite side of the field facing in the opposite direction.
 - If possible, using a red and blue lego brick, stickers, or etc to delineate robots is very helpful for the referees.
- Give teams about one minute after being called to the field to arrive and begin setting up their robots. If a team does not report to the field within a reasonable amount of time, they forfeit the match.
- Teams are given sufficient time to select the program to run and get the robot menu to the 'ready to run' state, i.e. one more button push will start the robot.
- The field should be clear of any debris or unintended markings. Students and spectators should be several feet from the field, to not interfere with the robot sensors.
- The teams indicate readiness to start the match by giving the Referee a thumbs-up signal.
- The Referee starts the match by counting down 3-2-1-GO! When the Referee says "GO" the teams start their robots and immediately move at least three feet away from the field so that the robots do not detect and follow the students.



Matchplay

- Once the robot is started, teams are not allowed to touch their robot until requested by the Referee.
- It is not unusual for a student to have difficulty starting their robot. This can be especially true for students with disabilities. If the team member is having a difficult time starting their robot, allow them to continue until they get the robot started. The Referee may need to assist. If in the process either robot starts to follow a person at the ring rather than the opponent robot, stop the match, reset and restart.
- The match is over when one of the robots is pushed so that more than half of its main body is onto the black ring.
- If the robot has long attachments, the Referee will make the judgement based on the main body of the robot. The main part of the robot is typically the section housing and supporting the LEGO control module.
- It is not unusual for the robots to become locked together, spinning in a circle. If this happens, watch for progress being made toward the ring edge. If the robots are not making progress toward the edge for more than fifteen seconds, restart the match. If the condition persists, restart with the robots starting in a different orientation. It may require starting the robots pointed directly at each other to get a clean match.
- It is not unusual for a robot (especially a large robot) to rotate more than half of its main body onto the black ring during normal operation. In other words, it goes onto the black without being pushed by the opposing robot. While technically this robot is out, the idea is that the robots are actively pushing each other out. If the robot simply drives completely out of the ring it can be determined out. Otherwise, if the robot has not been pushed out by the other robot, allow match play to continue.
- The duration of the match will be timed by a second referee. This time will be used only for any necessary tie-breakers at the end of qualification play.

Tournament Rules

The tournament is played in two parts. Part one is the Qualification rounds. These are random matches among all the robots (or all the robots in a given Division). Part two is the Elimination Rounds. This uses a bracket-based, winner advances model for the matches, until one Team remains, and is the tournament champion!

Qualifying Rounds

Depending on the total numbers of Teams in the event, Divisions may be used to ensure all Teams have the most matches possible, in a reasonable amount of time.

Some Examples:

Total Number of Teams	Number of Divisions	Number of Teams Per Division	Number of Matches a Team will Play	Number of Teams Advancing
7-12	1	7-12	6-11	4 or 8
14-22	2 or 3	7-11	6-10	4 or 5 (plus Wildcard)
24-36	3 or 4	8-12	7-11	5 (plus Wildcard) or 4

A match schedule will be created that randomly assigns Teams to play one another. Each Team will play against each other Team (or each other Team in their Division) at least once. Depending on the event timing, the schedule may be repeated for more matches!

Teams will earn Tournament Ranking Points - 2 for a win, 1 for a tie, 0 for a loss - for each match played.

Ranking Teams

After the qualifying rounds, Teams will be ranked based on their Tournament Ranking Points and any necessary tie-breakers. For events with multiple Divisions, each Division will be ranked individually. If teams have the same number of Tournament Ranking Points, the following tie-breaker rules will determine the other. (This is true if two or more teams have the same number of Tournament Ranking Points.)

- First tiebreaker is reviewing a previous match where the two same teams competed. If the teams played multiple matches against each other, use the results of all matches. The winning team of that previous match will be ranked higher.
- The second tiebreaker is the average win time. The team with the shortest average win time will be ranked higher.
- The third tiebreaker is the chronological wins order. This looks across all of the Qualification Matches, counting how many wins in a row a given team achieved. For instance, if one team had four match wins in a row while the other team had only three wins in a row, the team with four in a row would be ranked higher.
- The final tiebreaker is a coin flip, witnessed by members of both teams. The Head Referee will assign heads to one team, tails to the other, and flip a coin. The team that matches the visible coin face will be ranked higher.

After ranking, a number of Teams (or Teams from each Division) will be placed into a bracket for the Elimination Rounds. The number of advancing Teams must be a multiple of 2 (4, 8, 16, or 32) for a complete bracket.

Building the Bracket

The Eliminations bracket is built in such a manner that the highest ranked teams play the lowest ranked teams in the first level of the bracket. For events with multiple Divisions, the bracket should be built such that teams compete against teams from other Divisions.

Single Division Example:

Ranking	
1. Team Awesome	5. Unicorn Bots
2. Cool Cat Bots	6. 3B (Big Bad Bots)
3. Super Duper Amazing Explosion	7. MegaBots
4. Team Name	8. Bits and Bots

Match 1	1. Team Awesome				
	8. Bits and Bots	Match 5	Winner Match 1		
Match 2	4. Team Name		Winner Match 2		
	5. Unicorn Bots			Match 7	Winner Match 5
Match 3	3. Super Duper Amazing Explosion				Winner Match 6
	6. 3B (Big Bad Bots)	Match 6	Winner Match 3		
Match 4	2. Cool Cat Bots		Winner Match 4		
	7. MegaBots				

Multiple Division Example:

Division 1 Ranking	Division 2 Ranking	Division 3 Ranking	Division 4 Ranking
1. Team Awesome	1. Super Duper Amazing Explosion	1. Cool Cat Bots	1. Team Name
2. 3B (Big Bad Bots)	2. Unicorn Bots	2. MegaBots	2. Bits and Bots
3. Purple Mayhem	3. Frank and Frank	3. Gear Robotics	3. Schoolyard Bots

Match 1	Div 1 Rank 1. Team Awesome				
	Div 4 Rank 2. Bits and Bots		Winner Match 1		
Match 2	Div 2 Rank 1. Super Duper Amazing Explosion	Match 5	Winner Match 2		
	Div 1 Rank 2. 3B (Big Bad Bots)			Match 7	Winner Match 5
Match 3	Div 3 Rank 1. Cool Cat Bots				Winner Match 6
	Div 2 Rank 2. Unicorn Bots		Winner Match 3		
Match 4	Div 4 Rank 1. Team Name	Match 6	Winner Match 4		
	Div 3 Rank 2. MegaBots				

Elimination Rounds

Elimination rounds are played where Teams need to win 2 out of 3 plays, and the winner will advance to the next round. All rounds at the same level in the bracket are played before continuing onto the next level. (e.g. all quarterfinal matches are complete before starting semi-finals.) The bracket will conclude with a finals match between the last two Teams, and the winner of this will be the Tournament Champions!