

SUMMO

Robot Size Limit: 30.5 cm x 30.5 cm x 30.5 cm (12 in x 12 in x 12 in) Please note this is the size limit at start. A robot may expand to a larger size once a round has started. However, the robot must “expand or change dimensions” on its own power through the use of motors, rubber bands, or just the inertia of its movement. The operator cannot be the direct cause of the expansion or dimension change.

Robot Weight Limit: 1200g (2 lbs 10.32 oz) No external non-Lego like parts are allowed to reach this weight limit (aka: metal washers, fish sinkers, lead shot, etc.) See robot construction below.

Robot Control: Autonomous programming with 5 second delayed start (NO REMOTE CONTROL of any kind is allowed.)

Robot Construction: Any Lego, Vex, or other similar plastic components and or sensors may be used in any combination. No glues, tapes, tie wraps, magnets, sticky wheels, or suction cups are allowed. No sharp metal parts or a design that might be destructive to an opposing robot or people. All decisions in regards to this rule are at the sole discretion of the referee. All decisions are final.

Objective: In this competition two competing robots attempt to push their opponent out of a circular arena.

Arena: The arena in the competition is approximately 106.7 cm diameter circle (42 in) made of standard plywood. The arena has a black surface except for a white ~1 inch wide white line along the circumference of the circle. It is elevated approximately 1.5 inches above the table.

Scoring: Robots will compete with other robots in a double elimination tournament. To be declared the overall winner of a match, a robot must win two of three rounds against the opposing robot. Rounds last a maximum of 3 minutes. A robot that loses two full matches is eliminated from the contest.

Awards: Medals and or trophies will be awarded to the top three robot finishers.

Teams: Robots may be entered by teams of any size from one member to ten; however no more than three individual medals and or one team trophy will be awarded for each of the top three places.

Match Specifics: A match starts by both robots being placed at the same time behind the start lines (two black electrical tape lines approximately 30.5 cm (12 in) from the white at opposing ends of the ring). Once placed, robots cannot be repositioned. Robots may be placed in any orientation or direction. Operators will activate their programs once the go signal is given by the referee. Activation can be through brick buttons, touch sensor, ultra sonic sensor, sound sensor, or IR sensor. Once activated, operators must stand back to avoid being detected by any robot sensors.

Robots cannot move in any way for 5 seconds after program start (this includes any expansion motions). If a robot moves early, it is a false start. Robots are returned to position and the round is restarted. A second false start by the same robot will result in the loss of that round, but not the match unless it false starts an additional two times. A non-start by a robot is considered the same as a false start and all rules related to it apply to non-start situations. However, a non-start is not a slow or late start due to programming error or loose cables. This is determined by any movement the robot makes before or after it is possibly pushed out of the ring.

The objective is to push the opposing robot over the white line and partially out of the ring if not completely out. A robot is considered out if at least one wheel or similar part is beyond the white ring. Other nonessential parts to the forward motion or overall drive of the robot that exit the ring will not be considered grounds for defeat unless time is reached and a tie breaker decision is applied. A robot does not have to be completely pushed out to be defeated. Wheels or similar parts pushed out of the ring usually result in the robot becoming stuck or unable to recover forward progress. If both robots exit the ring or partially exit, it will be the discretion of the referee as to which robot was the first to do so. If this cannot be reasonably determined, the round will be rerun.

There is a time limit of three minutes per round. If neither robot has been pushed completely or partially out of the ring in the three minutes, the referee may choose from the following options:

1. Re-do the round
2. Declare a winner based on which robot was pushed out of the ring the most (Any and all parts of the robot can count towards this decision.)
3. If neither robot has any part that has left the ring at round end, the winner is the robot who has pushed the opposing robot closest to the white line at the end of three minutes.
4. The robot that has been most in control or charge of the round at the referee's discretion.
5. Coin-flip, if all else fails to determine the round winner.

The winner of a round places the robot in start position first in the following round. The loser of the previous round gets to place their robot last. Robots again, cannot be repositioned once set. This is to give the losing robot a competitive chance to even the rounds and extend the match the full length of three rounds.

The match winner is the robot that wins two rounds of the possible three. Two overall match losses will result in elimination from the tournament bracket.

These rules are generally based on the following resource and any situation not addressed in the above rules will be handled through review and consideration of this source.

<http://www.robotroom.com/SumoRules.html>

Battle Bots

Robot Size Limit: 38 cm x 38 cm x 38 cm (15 in x 15 in x 15 in) Please note this is the size limit at start. A robot may expand to a larger size once a match/round has started. However, the robot must “expand or change dimensions” on its own power through the use of motors, rubber bands, or just the inertia of its movement. The operator cannot be the direct cause of the expansion or dimension change.

Robot Weight Limit: 1500g (3 lbs 3 oz) No external non-Lego like parts are allowed to reach this limit (aka metal washers, fish sinkers, etc.) See robot construction below.

Robot Control: Remote control through phone app, pad app, laptop program, hand remote control is highly encouraged and the best possible strategy. Autonomous programming is allowed, but the randomness of many possible scenarios makes this type of control not the most effective.

Robot Construction: Any Lego, Vex, or other similar plastic components and or sensors may be used in any combination. No glues, tapes, tie wraps, magnets, sticky wheels, or suction cups are allowed. No sharp metal parts or a design that might be overly destructive to an opposing robot or people. We do not want to permanently break any highly expensive robot parts. Damage to cables or general plastic components, loss of one or more wheels, flipping over on side or top, and general dismantling of the opposing robot do not apply to this standard as this could very well happen as a result of any number of situations caused by an opposing robot or part of the field itself. All decisions in regards to this rule are at the sole discretion of the referee. All decisions are final.

Objective: In this competition, four competing robots attempt to immobilize the progress of opposing robots in a five minute time period by inflicting legal damage to the opposing robot (see construction rule), flipping the robot over on its side or back, and or entrapping the robot in debris or other obstacles.

Arena: The arena is two 4 ft by 8ft FLL tables placed together as they would be for FLL. However, the robots may travel from one table to the other via a connecting ramp positioned between the tables. Both sides have a multiple obstacle course of various items that can make motion difficult or impossible. In addition, there are multiple structures that may be knocked down and displaced in any manner to create additional obstacles to impede, damage, or entrap opposing robots. Basically, destruction of the field set up is legal and encouraged as part of the contest.

Scoring: Being revised. Updates will be coming soon.

Awards: Medals and or trophies will be awarded to the top three robot finishers.

Teams: Robots may be entered by teams of any size from one member to ten; however no more that three individual medals and or one team trophy will be awarded for each of the top three places.

Match Specifics: A match is a five minute free for all battle between four robots (two robots on each connected FLL table). The goal of immobilizing the opposing robots is the objective through inflicting legal damage to the opposing robot (see construction rule), flipping the robot over on its side or back, and or entrapping the robot in debris or other obstacles. Alliances between robots are legal, but at some point in the match or later rounds this will break down as there can be only one overall champion. Multiple robots may

advance from the preliminary rounds to the following round until there is only one winner advancing. Advancing robots will be randomly placed in matches with other advancing robots. Matches continue until there is one surviving robot in the end. The time limit can be extended at the referee's discretion as necessary, and this will likely happen in the later rounds to determine the 1st place winner.

A robot is declared out of a match is at any point when it becomes "immobile or entrapped" as described earlier. The referee will begin a ten second count down to "count out the robot" much the same way it is done in wrestling or boxing. Once counted out, the operator must stop all remote operation of the robot and or robot programs. The robot itself is NOT removed from the field until the full match is declared over. Once counted out the robot is out and cannot reenter that match under any circumstances.

Robots that lose a match will be given a short time for repairs and will be randomly reentered into the one loss bracket. The tournament is double elimination and a second overall loss will result in elimination.

The final championship determining round will be between the top four robots. The first two eliminated will compete in a separate match to determine third place. The winning robot will compete against the second finisher until one of them has two overall losses. The winner will be the 1st place winner and the loser will receive 2nd place.

Since this contest is new and being developed as it is conducted for the first time, the tournament structure and rules may be adjusted as necessary due to situations that arise or time constraints. Please be patient and understanding of this process.

Line Following Race

Robot Size Limit: 30.5 cm x 30.5 cm x 30.5 cm (12 in x 12 in x 12 in) Note that a smaller robot would likely be more productive than larger one in this contest.

Robot Weight Limit: none

Robot Control: Autonomous programming through use of a light sensor to follow a black line. (NO REMOTE CONTROL of any kind is allowed.)

Robot Construction: Any Lego, Vex, or other similar plastic components and or sensors may be used in any combination.

Objective: In this competition, a robot must successfully follow a course made of a winding black line on regular white floor tile two complete laps in the shortest amount of time.

Course: Armstrong brand commercial vinyl floor tile (off white with speckles) 12 x 12 inch squares with $\frac{3}{4}$ inch black electrical tape line up to 400 inches long in shapes of a straight section, curve, and or double curve. Curve radius is approximately 6 inches.

Straight Double curve Curve

Scoring: Each robot will be given three chances to complete the course (two full laps). Time will be noted for each attempt. The three fastest robots will be awarded. If no robot or less than three robots complete the course in two full laps, then completion time for one full lap will be used to determine the winners. Awards will not be given to any robots that do not complete at least one complete lap. In the event of ties, a second course will be arranged or modified for a tiebreaker round.

Awards: Medals and or trophies will be awarded to the top three robot finishers, if we have three qualifying robots. (See scoring above.)

Teams: Robots may be entered by teams of any size from one member to ten; however no more that three individual medals and or one team trophy will be awarded for each of the top three places.

Levels: Depending on participation, this contest may be include levels such a beginner, medium, and advanced. Awards will be given for these levels if successfully completed.