

West Side Robotics
LEGO SUMO RULES

Goal:

- The goal of Lego Sumo is for a Lego Mindstorms robot (RCX, NXT or EV3) to push or flip an opponent robot out of the ring within the allotted time frame. We realize that there are many variations to the rules for Lego Robot Sumo; these will be the rules for this tournament and we ask that entrants read and be familiar with this particular rule set at the time of the tournament, in order to avoid surprises.

Team:

- A “team” is comprised of one or more students who have built a robot for this event. Each team should also have one adult present with the team.
- The robot must be an autonomous robot the team has constructed themselves prior to the tournament to the specifications below. This event is not a workshop where you may build robots after arrival. There will be limited time for adjustments and changes to the robots and their programming during the event. (There is a FREE workshop for help building and programming the robots in the morning prior to the event. See the website for more information on this workshop.)
- Only one team member may enter the outer ring to start the robot; other team members may watch from outside the outer ring.
- Each team/robot will be assigned a number on check-in and should have a unique name or identity to be easily recognized by spectators and officials when on the field and when scoring.
- (While this is an ideal “off-season” activity for First Lego League teams, entrants DO NOT have to be made up of FLL team members, and this is also an ideal activity for those with an interest in trying Lego robotics for the first time!)

Robot Construction:

- The sumo robot may only be comprised of official Lego parts, which cannot be held together by any means other than the standard Lego construction methods (no tape, glue, stickers, etc.). No homemade sensors, multiplexors, or modifications to Lego elements are allowed. No modification to Lego parts by gluing, cutting or melting is allowed.
- Up to FOUR motors with rotation sensors are allowed, and any other sensors manufactured by Lego may be used. No “made for Lego” third party sensors are permitted for this tournament.
- It may include attachments as tactical or strategic elements that are passive or motorized, but may not include projectiles or other parts that separate from the robot.
- It is encouraged that robots be decorated or themed with Lego parts.
- There will be limited time and space for last minute design improvements and adjustments, however, the robots should be completed at the time of registration, and once check-in takes place, the robot design or its programming may no longer be modified. Robot battery should also be sufficiently charged once the robot is checked in.

Robot Size:

- When started on the field, the robot must fit inside a 30 cm square frame.
- The robot must not exceed 1 kg.
- The robot may extend out from this size after the match has started.

Programming:

- Teams may use their own programming or may use a program from written or online sources such as that on nxtprograms.com. Unique strategy (such as the use of motorized attachments, unusual turning patterns, special drivetrains) is encouraged, but the programming from this site or other similar programs is a good start.
- The robot must be autonomous. No Bluetooth or other wireless control of the robot on the field is permitted.

- Robot programming must include a 5-second delay after the operator starts the program before the robot begins any movement on the field. This will need to be demonstrated upon check-in. Any robot movement before the 5 second delay will give an advantage point to the opponent. Sound and lights *are* permitted during the 5-second countdown.

Robot Restrictions:

- The robot is restricted from destructive action. No liquid, powder, gas, no inflammatory device, no parts to do damage to the ring or opponent, no sharp edges. It is not permitted to use sticky substances, suction cups, vacuum pumps or magnets.
- The robot may expand in size or change shape, but must not separate into pieces. Small parts of less than 5 g falling off the robot during competition shall not cause loss of match. If a small piece is dropped from the robot, it will remain in place on the field until the end of that bout, when the judge will remove it. If multiple small parts fall off the robot, or if the judge feels the strategy of the program involved purposeful separation of robot parts, an advantage point will be awarded to the opponent.
- Judges will have the discretion to disqualify any robot whose strategy is deemed to be too dangerous.

Player Restrictions:

- When teams are called to the ring for their bout, teams are to present to the field promptly, and each team is to greet the other with a bow or handshake.
- Players are to behave in a respectful manner, and are not permitted to use profanity or insulting words or actions, or to have their robot use such words or actions. Unsportsmanlike behavior will not be tolerated. Such behavior will result in a violation or disqualification at the judge's discretion.
- Only one team member may enter the outer ring area. Once starting the robot program field, that team member may no longer touch the robot or the field until the judge calls for a reset, or until the judge declares the winner of the bout.

Advantage Points for Violations:

- A robot or player in violation of the above restrictions will result in an advantage point awarded to the opponent robot.
- An advantage point will also be awarded to the opponent if the robot starts before the required 5-second delay, if preparation for a match or reset takes longer than 30 seconds, or if a robot stops movement on the ring.

Ring:

- For this meet, the ring will be made of wood or similar material with a white vinyl surface, about 1 meter (39 inches) in diameter, with a black border 2.5 cm (1") wide. The sumo ring will be raised above the exterior ring surface.
- A robot will be considered to be out of the ring when any part of the robot touches the exterior ring surface. A robot hanging on the black border will still be considered to be inside the ring.
- Centrally placed in the ring are two thin parallel red lines 10-11 cm (4 inches) apart to indicate the starting area. They may be envisioned to continue from edge to edge, and the robot may be placed anywhere behind this line to start.
- The area immediately around this ring, termed the "Outer Ring", will be marked with tape or cones. Only one player from each team may enter the outer ring with the robot at the start of the match.

Start of Match:

- One player from each team will enter the outer ring with the robot and they will greet each other.
- Upon the signal of the judge, the robots will be simultaneously placed behind the starting lines. The robot does not have to be squarely behind the line, but could be shifted to either side or placed at an angle, as long as all parts of the robot are behind the line.
- Robots are not allowed to be moved once they have been placed.

- Upon the start command from the judge, the players will start the robot program, and then step back from the ring. The robots must have a delay of 5 seconds before starting any movement, or an advantage point for violation will be awarded to the opponent.

Match:

- A match will consist of up to 3 bouts within the total time of 3 minutes. Teams should take no more than 30 seconds between bouts in a match to allow for repair to the robots. If a robot is unable to restart, the opponent will be awarded an advantage point. The restart of each bout will follow the same procedure as the start of the match.

Deadlock:

- If the robots become locked together without further action or movement for 15 seconds, or if they rotate in circles many times and it is the Judge's discretion this will not end, or if both robots leave the ring at the same time, the Judge will allow a reset. Maintenance of the robots is prohibited in this case, and both players will immediately place the robots as at the beginning of the match and restart them on the Judge's start command.

Judging:

- The Judge will determine the winner of each bout, and will award any advantage points for violations, and has the discretion to disqualify any robot or team not meeting the requirements for competition.
- The judge's decision is final, and cannot be disputed once competitors leave the outer ring area.

Winner of Match:

- A robot will be awarded 2 points for a bout win, 1 point for an advantage (from a violation by the other team), 1 point for a draw (neither robot leaving the ring within 3 minutes), zero points for a loss.
- A robot achieving 4 points will be declared the winner of the match, even if 3 bouts have not occurred or 3 minutes has not elapsed.

Championship:

- The tournament will use the double elimination tournament method.

Awards:

- Awards will be presented for champion and runner-up.

Flexibility of Rules:

- As long as the concept and fundamentals of these rules are observed, flexibility will be allowed to encompass changes in the number of players or other rules changes as deemed necessary by the judges and officials.