RoboCup Junior South Australia

Robot Sumo Rules

2026

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RoboCup Junior South Australia Committee

RCJSA Robot Sumo Rules

RCJSA Sumo is a competitive sport where two autonomous robots go head-to-head in a competition to try to push or flip the other robot out of a circular ring. The first robot to touch the floor outside of the ring loses. The last robot remaining in the ring wins the round. The robot that wins the most rounds wins the contest. While pushing your opponent out of the ring is the most common way to win a round, disabling your opponent (flipping and lifting) is strongly encouraged.

Code of Conduct

It is expected that all participants, students and mentors, will respect the aims and ideals of RoboCup Junior as set out in our mission statement. In turn, the volunteers, referees and officials will act within the spirit of the event to ensure the competition is competitive, fair and most importantly, fun. “It is not whether you win or lose, but how much you learn that counts.”

Sharing

It is the overall desire of RoboCup Junior competitions that any technological and curricular developments will be shared with other participants after the competition. Any developments, including new technology and software examples, may be published on the RoboCup Junior website after the event, furthering the mission of RoboCup Junior as an educational initiative. Participants are strongly encouraged to ask questions of their fellow competitors to foster a culture of curiosity and exploration in the fields of science and technology.

Advice vs. Rules

This document includes advice to the competitors and mentors, plus firm rules; this has been done to ensure clarity. A numerical reference indicates rules. Advice is marked as “*Advice*”.

The aim is to win and to have fun.

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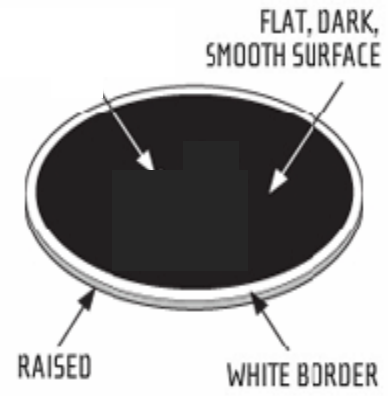
1. The Playing Field:

1.1 The Arena - is the area where the sumo robots will compete.

1.1.1 The arena will be a circular ring 1000 to 1200 mm in diameter for Featherweight and Standard. This must include a 50 mm thick white border around the ring's perimeter (see diagram for details). The arena is placed flat on the floor.



1.1.2 Heavyweight Sumo matches are played on a circular ring 1200 to 1400 mm in diameter. The field can also be raised to a maximum of 50mm in height. **At competition the field will be 1400mm**.

1.1.3 The Arena could be black with a white border. If black and white is not used, then colours of high contrast must be used e.g. red/green or orange/blue

2. Sumo Challenge Divisions

The challenge is broken up into 3 divisions:

- Featherweight Sumo
- Standard Sumo
- Heavyweight Sumo
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Students may only compete in Featherweight for a maximum of two combined competitions across RCJSA and Sumomania. After this, students must move into Standard or Heavyweight if they wish to continue competing. Students who have participated in Sumo for several years are encouraged to eventually transition to another RoboCup competition to gain a more well-rounded RoboCup experience.

3. Robot Construction:

3.1 Featherweight Sumo

3.1.1 All participants can use a single NXT, EV3, Spike Prime, VEX, Microbit Nezha (or equivalent) or Robot Inventor 51515 brick.

3.1.2 No glue, tape or non-LEGO rubber bands are allowed.

3.1.3 Participants can only use the kits proprietary software.

3.1.4 **The weight of the robot cannot exceed 600 grams (with a 10g buffer)**

3.1.5 **<u>Each robot may only use:</u>**

- up to 2 motors for driving
- up to 2 touch sensors for bump sensing
- 1 light/colour sensor
- 1 ultrasonic sensor

3.1.6 **4 wheel drive systems, gearing, 3D printed parts and tracks are not permitted.**

3.1.7 All robots must fit within an open-top 210mm (L) x 210mm (W) x 210mm (H) frame, (including mechanisms / pieces at their full extension).

3.1.8 Robots must be entirely autonomous; they need to work independently from start to finish once pressed from the brick.

3.2 Standard Sumo

3.2.1 All participants can use a single NXT, EV3, Spike Prime, VEX, Microbit Nezha (or equivalent) or Robot Inventor 51515 brick.

3.2.2 No glue, tape or non-LEGO rubber bands are allowed in the construction.

3.2.3 Participants can only use the kits proprietary software.

3.2.4 **The weight of the robot must be between 700 - 900 grams (with a 10g buffer).**

3.2.6 **Each robot may only use:**

- up to 2 motors for driving
- 1 motor for lifting and flipping.
- up to 2 touch sensors for bump sensing
- 2 light/colour sensors
- 2 ultrasonic sensors
- 1 gyro / compass sensor

3.2.7 3D printed lego bars/pieces can be used however, **CANNOT** form scoops or walls

3.2.8 **4 wheel drive systems and tracks are not permitted**

3.2.9 All robots must fit within an open-top 210mm (L) x 210mm (W) x 210mm (H) frame, (including all capturing, lifting mechanisms at their full extension).

3.2.10 Robots must be entirely autonomous; they need to work independently from start to finish once pressed from the brick.

3.3 Heavyweight Sumo

3.3.1 The robot can be made from any kit or material but can only have one controller (brain) controlling it.

3.3.2 No glue, tape or non-LEGO rubber bands are allowed in the construction.

3.3.3 **The weight of the robot must be between 1kg and 1.5kg**

3.3.4 **Each robot may only use:**

- up to 3 motors for driving
- 1 motor or actuator for lifting and flipping
- up to 2 touch sensors for bump sensing
- up to 2 colour/light sensors
- up to 4 ultrasonic or infrared sensors
- 1 Gyro sensor
- 1 pixy camera

3.3.5 Robots may be remotely started if the program is stored on a Device. Once started, the device isn't to be touched unless a restart has been called by the referee.

3.3.6 Robots must be entirely autonomous; they need to work independently from start to finish.

3.3.7 The use of 3D printed, and laser cut pieces are permissible.

3.3.8 All robots must fit within an open-top 250mm (L) by 250mm (W) x 210mm (H) frame, (including all capturing, lifting mechanisms must be fully extended).

3.4 Common rules across all divisions

3.4.1 No robot is allowed to have any piece that may cause damage the arena

3.4.2 The robot must not include any part that fixes the robot to the playing field surface.

4. Inspection

4.1 Scrutineering

4.1.1 All competing robots need to be presented for scrutineering at the start of the competition (including presenting the scrutineering sheet). If a team arrives late, they must have their robot checked before competing and will forfeit a round if called up to compete.

4.1.2 Any robot failing scrutineering, will be asked to make appropriate adjustments before a re-scrutineering will happen. This process will continue until judges are satisfied. If a team is called to compete and are not ready, they will forfeit the round.

4.1.3 A judge or committee member may ask to inspect a robot to ensure it meets the conditions of that competition before the next match.

4.1.4 It is the responsibility of the team / mentor to ensure the robot meets the conditions of the competition they are entering. Failure to do so may result in disqualification.

4.2.3 The team may be asked to present and explain their programming, so this must be readily available.

5. Game Play

5.1 Set Up

5.1.1 At the beginning of a round, the sumo-bots will be placed next to each other in the middle of the ring, approximately 10cm apart, in a parallel position facing in the opposite direction from each other.

5.2 Game

5.2.1 When the referee signals the start of the match, one member of each team will start the robot manually (with an exception in Heavyweight where programs may be stored on a PC or device and then the device placed in full view of the ref and not touched during the match). Once the match has started, only the referee is allowed to touch the robots.

5.2.2 The robot must wait 3 seconds after the contestant presses a start button before it moves to allow teams to move out of the way, so the referee has a clear view.

5.2.3 Robots must move forward 10cm minimum towards the edge of the field before turning to compete. All actions must be pre-programmed. The use of any form of remote control is prohibited.

5.2.4 Robots must be actively seeking by moving around the field. Any robot that just turns on the spot and is not 'actively moving around the ring' will be disqualified from the round. This also includes robots that move a small distance and turn on the spot to search.

5.2.5 The robot must not intentionally obstruct or intentionally damage the opponent's robot or the playing field.

5.3 Length of Game

5.3.1 A match consists of a best of 3 rounds with a total time limit of 3-minutes allowed. Once the time limit has been reached the current standing result will be final. Finals are different.

- 3 points will be awarded for winning a match and one point each for a draw.

A round is over when the following happens:

5.3.1.1 A robot is either pushed out or falls off and completely 'out' of the arena.

5.3.1.2 A robot that is knocked over / flipped and fails to become upright and continue normal movement within a count of 5 it is eliminated.

5.3.1.3 The 3-minute time permitted for a round has run out.

5.3.1.4 One of the sumo-bots becomes disabled for a 5 count. This includes a robot that hangs or drives around the edge of the ring without being able to re-enter the full arena.

5.3.1.5 One robot loses 4 (not including connector pins/friction pegs) or more pieces. A motor / sensor that comes off but remains tethered is still considered as a lost piece towards the count of four. Any parts that fall off your robot during the match cannot be replaced.

5.3.1.6 If the robot is badly damaged and cannot be repaired within 30 seconds between rounds. Refer to section 5.4.2 for rules on in match maintenance.

Note: this includes the loss of a wheel or a track.

5.4 Restarts and Resets

5.4.1 A game will be stopped, and a restart or reset, started under the following conditions:

Reset	• Both robots touch the exterior of the playing field at the same time or if one or **both** are hanging off the field for a count of 5.
Restarts	• The robots have not detected opponents (i.e. sumo-bots have rotated in circles for 10 seconds or more). • Unintentional interference • Any other conditions under which the referee judges that no winner can be decided.

5.4.2 In case of a restart or reset, maintenance of competing robots is **prohibited**, and the robots must be immediately placed in the designated starting position – as close to the middle as possible and facing away from each other.

5.4.3 In the case of finals, if a winner has not been determined, then a Sudden Death match is called (section5.5).

5.4.4 All decisions by the referee are final.

5.5 Sudden Death (finals)

- A sudden death is a 1-minute round to resolve which robot is the winner from a previous, expired 3-minute finals match.
- In sudden death, both robots are repositioned and started by the judge. If no robot is found to be a winner at the end of 1 minute, the judge(s) shall declare a winner based on action observed within the circle.
- If they are still unable to make a clear distinction between sumo-bots, then a coin toss is used to determine the winner.