RoboCup Junior Australia

QLD Sumo Rules 2026

Version 1.2 | Last Modified: 23 Mar2026

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Sumo Queensland State Contact

Challenge Coordinators: Justin Pembroke and Nathaniel Brown (qld@robocupjunior.org.au)

Note: The QLD Sumo Challenge is a QLD-only Challenge.

Preface

Spirit

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 event 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 events that any technological and curricular developments will be shared with other participants after the events. 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.

Local Variations

These rules will be in use only for competitions within Queensland.

General Rules

General Rules have been introduced. Multiple sections of these Challenge Rules have been relocated to the General Rules to ensure consistency across all Challenges. Please ensure you read the General Rules, which can be downloaded from the Rescue Line Challenge Page on the RoboCup Junior Australia Website.

Notes/Advice vs. Rules

This document may include notes/advice to participants and mentors, plus rules that are firm. This has been done to remove ambiguity. There is a notation to indicate whether the content of this document is to be read as a note/advice or as a rule. Due to the significant changes from 2025, to be easier on the eyes, changes are now in blue font.

Summary of changes from v1.1

a) Changed table to reflect rule clarifications from v1.0 (3.1.1)

Summary of changes from v1.0

a) Added clarifications on stock kit parts for Primary and Secondary Sumo divisions (3.1.9b, 3.1.9c)

b) Added clarifications on only using ONE hub on the robot. A second hub cannot be used for weight (3.1.5b, 3.1.5c)

Changes from 2025

Summary of Key changes from 2025

a) Reorganizing divisions. There are now **four** divisions.

b) Standardization of Sumo Arena borders, supports, and perimeter.

c) Countdown timer – 3 second countdown (at the start of every round) must be displayed on the screen, for every robot that has a screen. For robots without a screen, scrutineering will include a portion on the code.

1 Sumo Challenge

1.1 What is Sumo?

Robot-sumo is an engineering and robotics competition in which two robots attempt to push each other out of a circular arena, in a similar fashion to the sport of sumo. Two robots compete in a head-to-head match following the basic system of traditional human sumo matches. Robots are allowed no weapons. The sole purpose is a pushing match between the two robots to force the other from the arena.

1.2 Event Divisions

1.2.1 **Primary Sumo**: Open to students at an age that would typically be studying at a recognised primary study provider. Team members can compete up to a maximum of two years whilst they are enrolled at a recognised primary study provider, after which they need to progress to Intermediate or Open divisions. Primary students who have competed two years in Primary Sumo will be ineligible for Secondary Sumo as they proceed to Secondary, and must progress to Intermediate or Open divisions.

1.2.2 **Secondary Sumo**: Open to all students at an age that would typically be studying at a recognised secondary study provider. Team members who are Year 7 or 8 when starting this division may compete in this division for two years. Team members Year 9 or older may only compete for one year in this division. After this period, they must participate in the Intermediate or Open divisions.

1.2.3 **Intermediate**: Open to all students at an age that would typically be studying at a recognised primary or secondary study provider. Team members are only eligible to compete for a maximum of 3 years in this division. After this period, they must participate in the Open division.

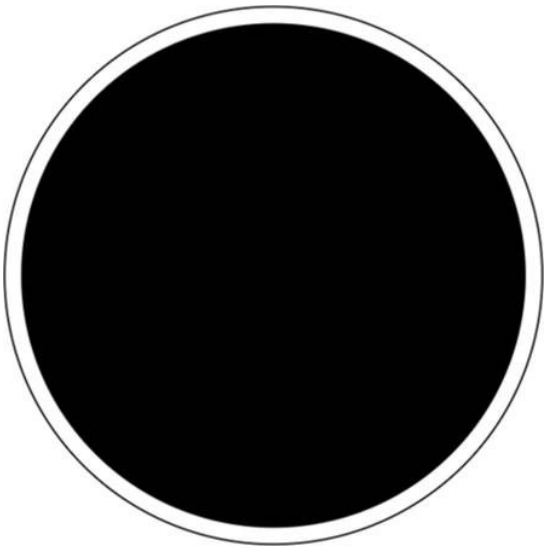
1.2.4 **Open**: Open to all students at an age that would typically be studying at a recognised primary or secondary study provider.

2 Battle Arena

All measurements have a tolerance of 5%.

2.1 Board

2.1.1 The Sumo Battle Arena is a one metre diameter circle generally made from 8 to 12mm MDF. The arena is black and features a 50mm white outline border.



2.1.2 The Sumo Battle Arena will be raised 60 to 70mm off the ground using timber blocks in three positions.

2.1.3 The Sumo Battle Arena will also have an area marked no less than 1m from the field that players must move behind to make sure that players do not interfere with distance sensors.

3 Robot

3.1 Common Robot Configuration

3.1.1 A robot must be constructed with the following parts:

Division	Rule	Primary	Secondary	Intermediate	Open
Construction	3.1.2 3.1.3	Only official plastic kit stock parts from the same vendor.		+3D printing	+custom +metal
Motors	3.1.4	3 x Standard kit motors only Limit of 2 motors powering the drivetrain (Stall Torque under 0.4Nm)		No Stall Torque limit.	12V or under.
Sensors	3.1.5	Any combination of sensors allowed though limited to one control source			
Wheels	3.1.6	Any same-branded wheels (LEGO for LEGO, Vex for Vex etc) may be used.		Wheels may not damage the play area.	
Other Materials		No other materials allowed including 3D printed parts, tape, glue, paint etc.		3D printed parts allowed Tape/Glue not allowed/Paint not allowed.	

3.1.2 Robot must be able to fit within a 25cm x 18cm rectangular frame. There are no height restrictions for robots and robots can expand outside the 25 x 18 size limit only after robot handlers have started the match.

Allowed parts:

Primary and Secondary: robots can only use stock parts made out of plastic.

Intermediate: robots may also include 3D printed parts.

Open: may also custom parts as well as metal parts.

Not allowed in all divisions: Tape/glue/paint etc are not allowed in any division. Infrared emitters are not allowed.

3.1.3 The robot must be 850g or less in weight.

3.1.4 Robots are allowed a total of 3 motors and have no more than 2 of these motors powering their drivetrain. Primary and Secondary divisions cannot use motors with a stall Torque higher than 0.4 N-m. All motors must be 12V or under. All LEGO motors are eligible for these divisions.

3.1.5 Multiple sensors can be used however, robots are limited to a single control source (eg. Spike Hub, EV3 Hub, CyberPi, Arduino). A single main controller brick should process all logic.

3.1.5b Even if a second hub is not used to control the robot, there can only be ONE hub on the robot in the competition. A second hub cannot be used to add weight.

3.1.5c External battery packs ARE permitted, as the technical committee recognizes that some older robots will have degraded internal batteries. The committee will review the one-hub rule at the end of 2026.

3.1.6 Wheels used must not cause damage to the competition field. Primary and Secondary may only use wheels from their stock kits.

3.1.7 All robots must include a mandatory 3-second wait at the very beginning of their program before any movement or sensor-driven actions begin.

- **Robots with a screen:** Must visually display a countdown (e.g., "3, 2, 1") during this period.
- **Robots without a screen:** Will have their code checked during scrutineering to verify the 3-second wait is present.
- Starting the program must be a single, simple action by the handler (e.g., pressing a button on the hub). Starting from a connected laptop, tablet, or phone is not permitted.

3.1.8 The robot is not permitted to have any mechanical parts that intentionally disconnect from the robot or that could cause intentional harm to another robot (weapons).

3.1.9 **Primary & Secondary Divisions:** The robot must **only** use stock kit plastic parts from robots that have a stall torque less than 0.4Nm. They may not use 3D printed parts or 3rd party parts including weights. Common robots that meet these criteria are: Lego Spike, Lego NXT, Lego

EV3, ZMROBO, Vex Go among others. Students or coaches who are unsure if their robots are eligible for this division should check with division chairs (qld@robocupjunior.org.au).

3.1.9b Due to feedback from participants who are unable to replace original kit parts, for 2026, if using a LEGO robot, any first-party LEGO plastic part may be used for Sumo. The same applies for VEX robots. Generally if a part has a LEGO number and the LEGO logo, it counts as a LEGO part.

3.1.9c Students who use 3rd party robot-compatible parts may consider joining the Intermediate Sumo division instead, where there are no brand restrictions on robot parts.

3.1.10 **Intermediate Division**: The robot must **only** use first party stock kit parts, and may use motors that are not limited based on torque. The parts must still be plastic, and 3D printed parts are allowed in this division. Typical robots in this category include VEX IQ and Micromelon Rover, in addition to students who wish to use robots from the Primary/Secondary divisions with 3D printed parts.

3.1.11 **Open Sumo**: Robots can be made from any platform and materials. This includes but is **not limited** to Lego/VEX IQ Robots, mBot, mBot2, Makeblock Rover, Micromelon Rover, Sphero RVR, microbit Robots, Arduino robots & 3D printed parts. Be aware that robots like VEX EXP and V5 will be too big or weigh too much. Students should ensure their robots adhere to the power limits set out specifically for the Open division (12V).

3.1.12 **Open Sumo**: The total cost of the robot must not exceed $1,000 AUD

3.2 Robot Control

3.2.1 Robots cannot be started from a secondary device, such as a laptop, tablet, or mobile phone. Robots must have their program downloaded to them and be able to be started/restarted manually by the Robot Handler.

3.2.2 Robots must be autonomous in operation. If the robot has the capability for remote or any other wireless control (such as by Bluetooth, Wi-Fi or another form of wireless communication), the team must prove that they have disabled the capability for third party operation in some way. This could be by software, hardware or degree of human interaction. Robots that do not comply may face immediate disqualification from the event. Distributed control is allowed but must operate without human interaction after the robot has started the round.

4 Game Play

Games will be organised into Preliminary matches before selected teams progress to the knockout finals to determine 1st, 2nd, 3rd & 4th.

4.1 Event structure

4.1.1 A Sumo match (3 rounds) lasts no longer than 5 minutes.

4.1.2 Preliminary Sumo matches consist of 3 rounds where all rounds must be played regardless of the score.

4.1.3 Knockout Final Sumo Matches are conducted on a best-of-3 match system i.e. the match is over if one team wins 2 rounds.

4.2 Official Rules

4.2.1 Referee will ask teams to place their robot on opposing sides of the board. The robots can face any direction but must be touching or overhanging the white line.

4.2.2 The referee will countdown "3, 2, 1, Sumo", on "Sumo" teams can start their programs by interacting with their control system on the robot. Robot handlers will then step back behind the boundary around Sumo Board.

4.2.3 Rounds may be called over by a referee during the following conditions:

1. A robot is considered out when a part attached to the main robot (physical component, cable or 3D object) is touching the floor. Debris or parts that have broken away from main robot do not count.
2. If both robots touch the floor then the first one to touch loses. If this cannot be determined by the referee, the round will end in a draw.
3. If a match lasts longer than a minute with no clear progression.
4. If a handler touches or interferes with a match. In this case a referee will determine if a restart is required or if a win will be given to the opposing team.
5. If both robots are rendered immobile e.g. they are flipped onto their side or visibly have sensor related problems that will impact on the match, then the round is declared a draw.

4.3 Minor repairs of the robot between rounds are permitted with the following rules:

1. Repairs should not take longer than 30 seconds.
2. Any repairs taking longer than 30 seconds may result in a round forfeit/loss. Should this occur in the 2nd round, the round time (1min) and subsequent repair time (30s) will be factored in before the start of the final round.
3. Significant modification to original design cannot be made e.g. alternative front end, change of wheels etc.
4. Referees are permitted to inspect robot after repairs or modifications are made to ensure competition rules are still adhered to.
5. Robots deemed to have had significant modifications or do not pass inspection will need to be rectified before the robot can compete in subsequent rounds. Failure to be ready for the next round may result in a round forfeit/loss.
6. All decisions around repairs/modifications are at the referee's discretion.

4.3.1 Weapons, infrared emitters, and intentionally dropped debris are against the spirit of the competition and are prohibited. Any form of play or parts deemed to violate the spirit of the competition may result in disqualification.

4.4 Selection for Finals

4.4.1 During the preliminary matches, teams will earn 1 point for every round win within a match (regardless of winning or losing the match).

4.4.2 Match forfeits will be recorded as a 3-0 win for the team who did not forfeit.

4.4.3 Teams will be ranked on the following criteria:

- Total points

- Total match wins
- Points difference (round wins – round losses)

4.4.4 Teams who cannot be separated by the above criteria will compete in a best out of 3 tiebreaker match.

4.4.5 The top scoring teams from each division will progress to the knockout finals.

4.4.6 Each division will aim for at least 8 teams to form Quarter-Finals. This is at the discretion of competition organisers and will be determined based off the total number of teams competing in each division as well as time constraints.

4.5 Finals

4.5.1 Teams in the finals will be seeded based on their overall placings at the completion of the preliminary matches e.g. 1st place of group 1 vs 2nd place of group 2 etc.

4.5.2 Teams will compete in 'Best of 3' Knockout rounds until four teams remain (Semi-Finals).

4.5.3 The winning teams of the Semi-Finals progress to the Grand Final while the losing teams compete for 3rd place.

5 Conflict Resolution

5.1 Referee

5.1.1 **During game play, the referee's decisions are final.** Any argument with a referee's decision will result in a warning. Any continuation of the argument will result in immediate forfeit of the match.

5.1.2 If team captains are satisfied with the result of a game, they are to sign the score sheet at the conclusion of the match.

5.1.3 Any protest after the match should only be if the scoring is believed to be incorrect. After signing the score sheet, no protests can be lodged.

5.2 Rule Clarification

5.2.1 Rule clarification may be made by members of the RoboCup Junior Queensland Sumo Technical Committee.

5.2.2 If a rule clarification is needed, the referee should stop the game immediately by calling a referee's timeout, stop the clock and confirm the ruling before continuing with the match.

5.3 Special Circumstances

5.3.1 Special modifications to the rules to allow for special circumstances, such as unforeseen problems, may be made at the sole discretion of the Head Referee and the Sumo Technical Committee to ensure the fair and timely progress of the event

6 Inspections

6.1 Scrutineering

6.1.1 The robot will be inspected by a panel of referees OR the chief competition judge before the event to ensure that the robot adheres to all relevant rules. Robots that comply will be issued with a sticker. Once a sticker is placed on the robot it is the

responsibility of teams to have their robot re-inspected if their robot is modified at any time during the event. Robots will be reinspected before knockout finals.

6.1.2 Any violations of the inspection rules will prevent the robot from competing in a round until modifications have been made to the robot and further inspection has been made.

6.1.3 Modifications must be made within the time schedule of the event. Rounds will not be delayed due to late teams.

6.1.4 If a robot fails to meet all specifications (including modifications) at the start of or during a match, the robot will be disqualified from that match (but not the event). This will result in forfeit/loss of the match.

6.1.5 Should the Coordinator (or other relevant person) on the advice of the officials then uphold the view of the scrutiniser, the team may be disqualified from the event.

6.2 Interviews

6.2.1 All teams making a final will be interviewed by a panel selected by the Technical Committee.

6.2.2 Teams may be queried about their Annotated Code and Digital Poster during their interview (see 6.3 below).

6.2.3 Interviews are not scored and do not contribute to overall team score.

6.3 Annotated Code and Digital Poster

6.3.1 Annotated Code

Teams must submit a copy of the most recent version of their competition code. The code must be clearly annotated with comments that explain the purpose and function of key sections of the program, including (where applicable) sensor use, decision-making logic, and actuator control.

Note: Teams are permitted to continue updating their code after the digital submission deadline, but must maintain an up-to-date version of their annotated code. Students may be asked to show this updated code to judges upon request.

6.3.2 The submitted code must accurately reflect the robot used in competition.

6.3.3 Teams who fail to submit their annotated code will not be permitted to compete.

NOTE: This can be submitted as a power point, screen shots with annotations, doc, etc.

6.4 Digital Technical Poster Submission

6.4.1 Each team must submit one (1) poster that communicates their team and robot design. Note: this poster may be shared publicly.

6.4.2 Teams **must not include any information** that should not be publicly shared (e.g. student personal information other than first name, photos that would allow personal identification, etc.).

6.4.3 The poster must be A3 size and must include all of the following information:

1 Team name
2 Team member first names and roles
3 One interesting/innovative feature of the robot's design or engineering
4 A challenge encountered during development and how it was overcome
5 What the team has learned through participation in the competition

6.4.4 The poster must be clear, well-presented, and suitable for display. Teams may generate the poster using any software they chose (PowerPoint, Canva, Paint, etc.) or make a physical poster and submit a photo/scan of the poster. The poster must be the team's own original work.

For early season events, a simple submission that covers key points is sufficient. The focus for early season is on participation and reflection, not graphic design.

6.4.5 Teams are encouraged to bring a physical copy of their poster to display at the competition, however this is not mandatory.

7 Items for Consideration in Future Rule Versions

This section outlines topics the committee has discussed but set aside for future iterations of the Sumo rules. Since Sumo is still in its early stages in Queensland, our current priority is establishing a solid foundation. These items are published here to:

- Give stakeholders visibility of the direction we are considering
- Provide an opportunity for feedback before any rules are finalised
- Serve as a roadmap for the evolution of Sumo in Queensland
  We want to make Sumo as fun and accessible as possible for everyone. Please send all feedback to **qld@robocupjunior.org.au**

7.1 Division Restructuring (Intermediate League)

If the Intermediate division continues to grow, we may consider splitting it into two tiers:

- **Intermediate** – Lower torque motors
- **Intermediate+** – Higher torque motors

Should this change proceed, maximum participation would be:

- **2 years** in Intermediate

- **1 year** in Intermediate+
- Then progression to Open division

Rationale: This would keep competition fair while accommodating the wide range of motor capabilities currently grouped together in Intermediate.

7.2 Decoration Guidelines

Some students enjoy customising their robots with decorations. We may introduce guidelines around what is allowed (e.g., paper-only decorations, adhesive restrictions). Care will be taken to distinguish between:

- **Pure decoration** – Aesthetic only, no gameplay impact
- **Functional modifications** – Decorations that could affect sensors, weight distribution, or match outcomes
- **Scrutineer decision final** – Adjudicators may require decorations to be removed before a match if they are deemed to potentially affect fair play.

Rationale: Encourage creativity and team identity while maintaining fair competition.

7.3 Weight Limit Review

Weight class divisions (eg Lightweight/heavyweight) and any increase to the 850g limit are not currently planned due to risk mitigation. The technical committee will review this position at the end of 2026.