Robot LEGO® Sumo Rules

(update 31/03/2026)

The event is organized by ItLUG – Italian LEGO® Users Group in collaboration with ItLUG Robotics Team.
It will be held on 2nd August 2026 - Detachment of Lecco (Polytechnic University of Milan) Gaetano Previati street, 1/c – 23900 Lecco (LC) Italy.

Short description: As in the traditional Japanese martial arts, the robots try to push the competitor out of the ring.

1 - Definition

A match is fought between two teams, each team having one or more contestants. Only one team member may approach the ring; other team members must watch from the audience. In accordance with the game rules (hereafter referred to as "these rules",) each team competes on a Dohyo (sumo ring) with a robot that they have constructed themselves to the specifications in Section 3. The match starts at the judge's command and continuous until a contestant earns two Yuhkoh points. The judge determines the winner of the match.

2 – Sub-categories

This year (2026) LEGO® Sumo competition takes place in two categories:

- Open (official competition with awards, reserved for students and Junior competitors)
- Expert (demo competition with also ItLUG Robotics Team robots, reserved for adults and Senior competitors)

At the time of registration you will have to indicate to which category you want to participate.

There are no limitations of age to participate.
The organizers reserve the right to check the experience of the competitors and will be able to move it from one category to another.

3 – Robot specifications

1. The robot must only be built out of LEGO® parts; this includes:
   - Parts manufactured and distributed by LEGO®
   - LEGO® licensed parts from third party manufacturers
   - Are allowed cables Mindsensors® or Hitechich®
   - Are also allowed cables "home-made" built form original cables LEGO®, Mindsensors® or Hitechnic®

   The organization decided, that the type of cabling in robots do not give any advantage, so to connect motors and sensors may be used cables of various origins.

2. All LEGO® Robotic Kit can be used (RCX, NXT, EV3, Spike, TechnicHub, MoveHub, WeDo, Power Function, Powered Up, etc ..).
3. Only one central unit can be used for each robot.
4. The number of electronic parts is limited to the capacity of the central unit.
5. The maximum dimensions of the robot are 15x 15 cm. There are no limitations of height.
6. The maximum weight of the robot is 1 Kg (with 1% tolerance)
7. A robot may expand in size after a match begins (5 sec. after the start of the judges), but must not physically separate into pieces, and must remain a single centralized robot. Robots violating these restrictions shall lose the match.
8. Screw, nuts, and other robot parts with a total mass of less than 10 grams falling off from a robot's body shall not cause the loss of match.
9. All robots must be autonomous. Any control mechanisms can be employed, as long as all components are contained within the robot and the mechanism does not interact with an external control system (human, machine, or otherwise). The robot must start no earlier than 5 sec. after being activated by the team component.
10. The judges may decide to register the robots and assign them a number identification. In this case, display the number on your robot to allow judges and spectators to identify him.

4 – Robot restrictions

1. Jamming devices, such as IR LEDs intended to saturate the opponents IR sensors are not allowed.
2. Parts that could break or damage the ring are not allowed. Do not use parts that are intended to damage the opponent's robot or its operator. Normal pushes and bangs are not considered intent to damage.
3. Devices that can store liquid, powder, gas or other substances for throwing at the opponent are not allowed.
4. Any flaming devices are not allowed.
5. Devices that throw things at your opponent are not allowed.
6. Sticky substances to improve traction are not allowed. Tires and other components of the robot in contact whit the ring must not be able to pick-up and hold a standard A4 paper (80 g/m^2) for more than two seconds.
7. Devices to increase down-force, such as a vacuum pumps and magnets are not allowed.
8. All edges, including but not limited to the front scoop, must not be sharp enough to scratch or damage the ring, other robots or players. In general, edges with a radius

of greater than 0.1 mm should be allowed. Judges or competition officials may require edges that they deem too sharp, to be covered with a piece of tape.

5 - Requirements for the Dohyo (Sumo Ring)

The Dohyo interior is defined as the playing surface surrounded by and including the border line. Anywhere outside this area is called the Dohyo exterior.

1. The ring is circular.
2. The borderline is marked as a white circular ring on the outer edge of the playing surface. The ring area extends to the outside edge of this circular line.
3. The construction material of the Dohyo is wood.
4. For all given Dohyo dimensions a tolerance of 5% applies.

Dohyo specifications:

- Total diameter: 77,0 cm.
- Border (white line): 2,5 cm.
- Minimum exterior space: 50,0 cm.

There is an appropriatespace outside the outer edge of the ring. This space can be of any colour, and can be of any material or shapes as long as the basic concepts of these rules are not violated. This area, with the ring in the middle, is to be called the "ring area". Any marking or parts of the ring platform outside the minimum dimensions will also be considered in the ring area.

6 - How to carry Sumo match

1. One match shall consist of 3 rounds, within a total time of 3 minutes, unless extended by the judges.
2. The team that who wins two rounds or received two “Yuhkoh” points first, within the time limit, shall win the match. A team receives a “Yuhkoh” point when they win a round. If the time limits reached before one team can get two “Yuhkoh” points, and one of the teams has received one “Yuhkoh” point, the team with one “Yuhkoh” point shall win.
3. When the match is not won by either team within the time limit, an extended match may be fought, during which the team who receives the first “Yuhkoh” point shall win. Alternatively, the winner/loser of the match may be decided by judges, by means of lots, or by a rematch. If the table of the tournament allows, judges may also decide a parity match.
4. One “Yuhkoh” point shall be given to the winner when the judges' decision was called for or lots were employed.
5. One match will be fought for a total of 3 minutes, starting and ending upon the judge's command. The time count starts 5 seconds after the start command of the judge.
6. An extended match, if called for by the judge, shall last for a maximum of 3 minutes.

7. The following events are not included in the time of the match:
    - The time elapsed after the judge announces "Yuhkoh" and before the match resumes. The standard delay before the match resumes shall be 30 seconds.
    - The time elapsed after a judge announces to stop the match and before the match resumes.

7 – Robot placing

Upon the judge's instructions, the two teams approach the ring to place their robots on the ring.

1. A cross in the middle divides the sumo ring into 4 quadrants.
2. Robots always have to be placed in 2 opposing quadrants.
3. The robots have to be placed at the border within the assigned quadrant.
4. The robot has to cover the white border at least partially.
5. After placing, the robots may not be moved anymore.
6. The judge will remove the cross after positioning of the robots.

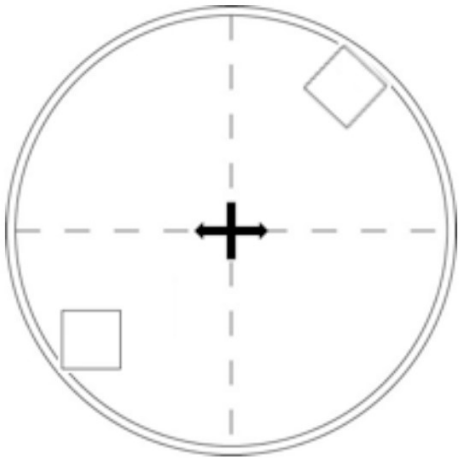

Fig. 1 – Example robots placement

7. When the judge announces the start of the round, the teams start their robots, and after at least 5 second pause the robots may start operating. During these 5 seconds:
    - Players must clear out of the ring area.
    - The robots must remain stationary (cannot expand beyond the size requirements).
8. The match ends when the judge announces so. The two teams retrieve the robots from the ring.

8 – Scoring (Yuhkoh)

One "Yuhkoh" point shall be given when:

1. A team legally forces the body of the opposing robot to touch the space outside the ring, which includes the side of the ring its self.
2. The opposing robot has touched the space outside the ring on its own.
3. When a wheeled robot has fallen over on the ring or in similar conditions, Yuhkoh will not be counted and the match continues.
4. A robot that starts before 5 sec. gets a warning. If the robot gets two warnings, it loses the match.
5. A robot that does not move after the start (false start) gets a warning. If the robot gets two warnings, it loses the match.

When judges' decision is called for to decide the winner, the following points will be taken into considerations:

6. Technical merits in movement and operation of a robot.
7. Penalty points during the match.
8. Attitude of the players during the match.

The match shall be stopped and a rematch started under the following conditions:

9. The robots are entangled or orbiting each other with no perceivable progress for 5 seconds. If it is unclear whether progress is being made or not, the judge can extend the time limit for observable progress for up to 30 seconds.
10. Both robots move, without making progress, and they don't meet for 30 seconds.
11. If both robots touch the outside of the ring at about the same time, and it cannot be determined which touched first.

9 - Injuries and accidents during the match

1. A player can request to stop the game when he/she is injured or his/her robot had an accident and the game cannot continue.
2. When the game cannot continue due to player's injury or robot's accident, the player who is the cause of such injury or accident loses the match. When it is not clear which team is such a cause, the player who cannot continue the game, or who requests to stop the game, shall be declared as the loser.
3. The judges and the Committee members shall decide whether the game should continue in case of injury or accident. The decision process shall take no longer than 5 minutes.

10 - Violations

Players performing any of the deeds described in Sections 4, and from 10.1 to 10.6 shall be declared in violation of these rules.

1. A player who utters insulting words to the opponent or to the judges is in violation of these rules.

A minor violation is declared if a player:

2. Enters into the ring during the match, except when the player does so to take the robot out of the ring upon the judge's announcement of Yuhkoh or stopping the match.
3. Demand to stop the match without appropriate reasons.
4. Take more than 30 seconds before resuming the match, unless the judge announces a time extension.
5. Start operating the robot within five seconds after the chief judge announces the start of the match.
6. Does or says that which disgraces the fairness of the match.

11 - Penalties

Players who violate these rules by performing the deeds described in Sections 4 and 10.1 shall lose the match. The judge shall give two Yuhkoh points to the opponent and order the violator to clear out. The violator is not honoured with any rights.

Each occasion of the violations described in Sections from 10.1 to 10.6 shall be accumulated. Two of these violations shall give one Yuhkoh to the opponent.

The violations described in Sections from 10.1 to 10.6 shall be accumulated throughout one match.

12 - Objections

1. No objections shall be declared against the judges' decisions.
2. In derogating from as provided on section 12.1, the lead person of a team can present objections to the Committee, before the match is over, if there are any doubts in the exercising of these rules. If there are no Committee members present, the objection can be presented to the judge before the match is over.

13 - Flexibility of rules

As long as the concept and fundamentals of the rules are observed, these rules shall be flexible enough to encompass the changes in the number of players and of the contents of matches. Modifications or abolition of the rules can be made by the local event organizers as long as they are published prior to the event, and are consistently maintained throughout the event.

The organisers of the competition reserve the right to divide the robots into sub-classes according to the age, level or any other characteristic of the participants.

14 - Liability

1. Participating teams are always responsible for the safety of their robots and are liable for any accidents caused by their team members or their robots.
2. The organizing committee will never be held responsible nor liable for any incidents and/or accidents caused by participating teams or their equipment.