

# Asia Pacific Robot Alliance Competition

Game Description, Rules and Scoring

## WeDo 2.0 Robot Sumo

Elementary  
(age: up to 12 years old)

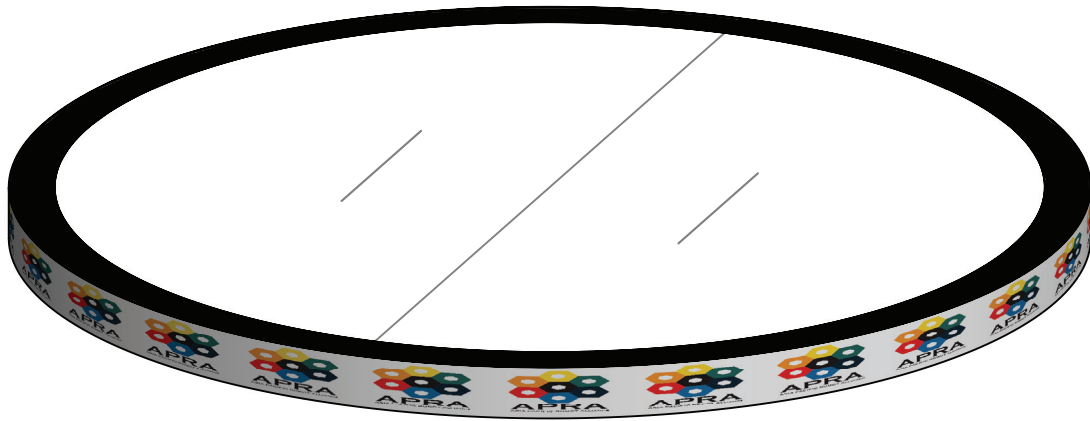
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**APRA**  
ASIA PACIFIC ROBOT ALLIANCE

## Introduction

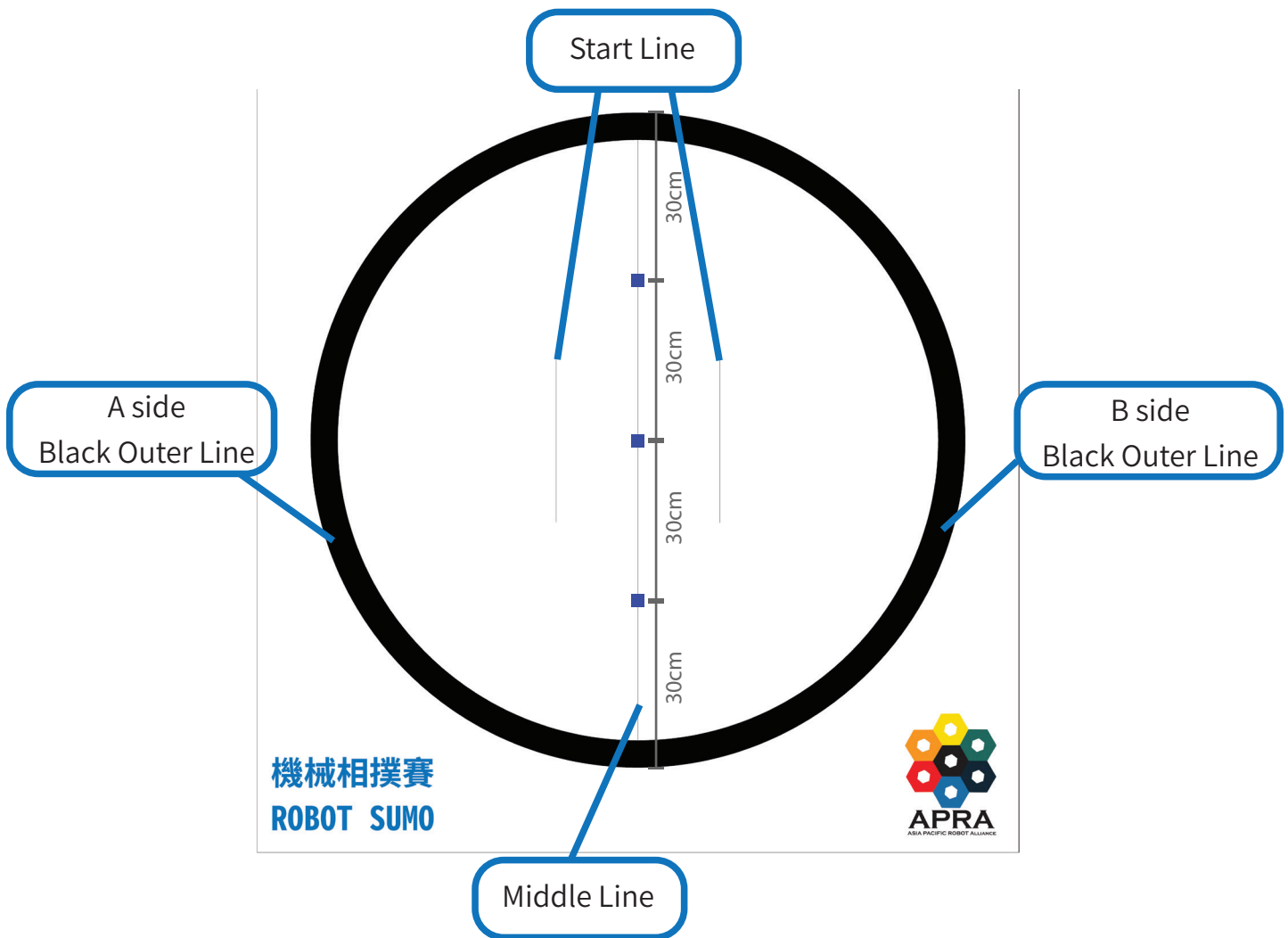
Each team consists of 1 - 3 members and 1 sumo robot. 1 team will compete with another team, targeting to push the other team's robot outside the field.



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## A. Game Rules



1. For each tournament, there will be multiple matches; for each match, there will be multiple rounds.
2. Before starting up the robot, the vertical projection of the robot should be entirely within the start zone. The robot must not be in the area between the start line and the middle line. After each round, teams will switch sides.
3. If any part of the robot is in contact with the floor, the corresponding team loses and the opponent team wins.
4. The duration of each round is 90 seconds. The final judgment will be based at the moment the game ends.

5. On the center line of the playing field are 3 marked locations. (as shown in the field diagram). Each round, only one brick will be placed on one of the markers. The judge will reveal the location decided randomly after teams have placed their robots.
6. After the judge signaled the start, the robots will need to operate fully autonomously for the first 30 seconds. There will be a 5 second countdown, then teams are allowed to remotely control the robot through the tablet until the competition ends. During the 90 seconds, the robot must not be stationary for more than 3 seconds each time. If violated, it will be seen as not moving normally and the round will immediately end with the opponent team winning.
7. When the 90 seconds time is up, the round ends, if both robots are still on the match field, the final judgment would be based on the following scenarios:
  - i. If only 1 of the robots are able to move normally, that team wins.
  - ii. If both robots are able to move normally, the winning team will be determined by the team that pushes the brick to the floor.
  - iii. If both robots are able to move normally and the brick is still on the playing field, the round will end with a tie.
8. At the end of a match, judges will record the results. This needs to be signed by teams to confirm on the results. Any queries or appeal about the match should be raised before confirming the results. All disputes afterwards would be neglected.
9. If judges discover a robot that does not qualify to the restrictions, teams may have 1 minute to make the relevant changes. If changes are not made in time, the team may not participate in that match.
10. The preparation time prior each round is 1 minute, a maximum of 2 members of the team are allowed in the competition area and teams are allowed to connect to and adjust their robot.
11. After each match has begun, if robot components have become detached from the robot, the judge may remove the components from the match field.
12. After each match has begun, modifications, component replacement or battery replacement is not allowed. Also, competitors may not request for a suspension of the competition.

13. After each round, competitor may use 1 minute to repair their robot on the spot. They may reassemble detached components but may not add or subtract components. Competitors may not use this time for a battery swap.
14. All teams must not bring their own field mat to the competition venue. Organisers will have provided match fields allowing for testing and adjusting. Teams may use the practice fields according to the schedule of the competition. There is no limit to the number of times they use the testing fields but each time is limited to 2 minutes. When queuing up for the testing field, teams are to only queue in line if they are holding a robot. Teams that line up without a robot could be subjected queue again from the end of the queue.
15. After the judge signals the start, if the competition is affected by any human intervention from the contestants, the round will end and the opposing team will win the round. If affected by other people, the round scores will not be taken for that round.
16. Prior the start of a competition, teams should ensure that the robot operates normally. It is not allowed at any time for contestants to interfere with the opponents remote control functionality. Violating teams will be disqualified.
17. For any special circumstances, all final decisions shall be subjected to the decisions of the judges and organisers.

## B. Scoring Method

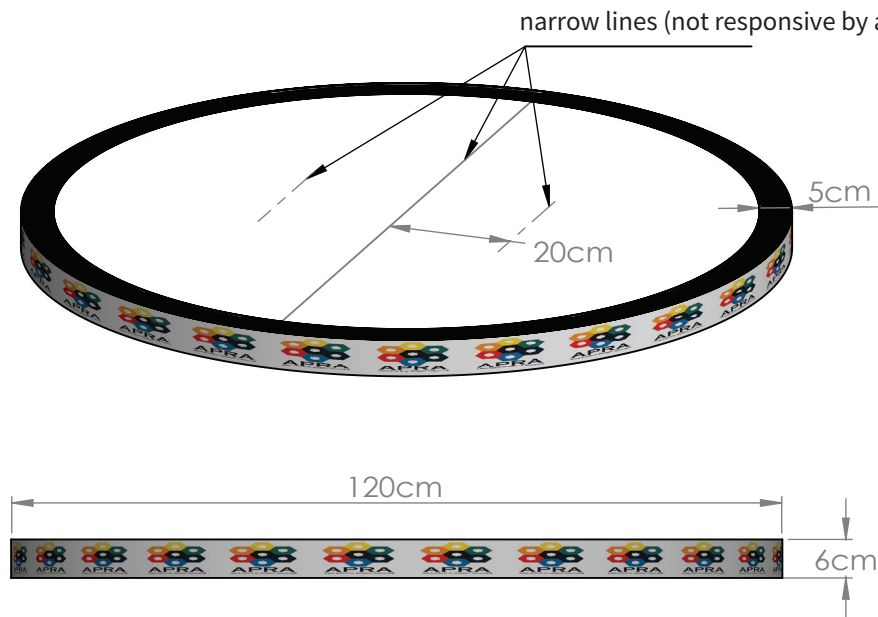
1. Each tournament may have a different competition structure (progression system i.e. group tournament or knock-offs etc.) Please be aware of the organiser's announcements.
2. For this tournament, the first stage will be a group tournament, each team will be assigned to a certain group where they will play against other teams in the same group. For teams that have the same ranking, a 'last standing' match will decide the ranking. The second stage will be a knock off tournament until the champion, 1st, 2nd and 3rd runner-up have been established.
3. In both group tournament and knock off tournament, matches will consist of 3 rounds. Teams that won in most of the rounds will win the match. If rounds won are equal, winner will be determined by the robot with a lower weight.
4. In the group tournament, each match won will give teams 1 point. After all matches, teams will be ranked within their group based on the number of points they have. Teams with equivalent points will be ranked by a 'last standing' match. The first 2 teams will advance into the second stage.
5. For the 'last standing' match, team place their robots on the match field based on the judge's directions. There will only be 1 round with a 60 second time limit. Teams will control the robot with their tablet.
6. In the knock off tournament, winning teams will advance.
7. During the 'knock off' and 'last standing' matches, if teams tie and the robot weight is the same, there will be extra matches organised. Teams will need to control their robot with the tablet for the 60 seconds long extra match. The matches will be repeated until a winner can be decided.

## C. Robot Specifications

1. The robot size must not exceed 18cm (length) x 18cm (width) x 18cm (height). Before each match, teams need to bring their robot to the inspection zone where judges will check that the robot meets the specifications. After the robot has passed the inspection, any modifications will not be allowed. After the match has begun, size restrictions do not apply.
2. Participating teams must provide their own tablet with the LEGO®Wedo 2.0 installed for programming and controlling the robot. After the inspection, the tablet and robot will need to be placed together at the inspection zone.
3. The robot must not exceed the weight limit of 300g (including batteries).
4. Only standard 1.5V AA lithium batteries may be used. The judge may request teams to open the micro computer for inspection. If found to be violating, teams will have 1 minute to correct the problem. If not completed within the time, teams are not allowed to participate in that match.
5. Competing robots may only use 1 microcomputer (Wedo 2.0 Smarthub).
6. Robots electronics (including electronic components: sensors and micro computer) must be from the LEGO® Education WeDo 2.0 Core Set.
7. Robots may only consist of 1 motor and 1 sensor. The type of sensor is not restricted.
8. Robots must be fully constructed using LEGO® parts.
9. Other forms of construction material are not allowed, for example glue, tape, screws etc.
10. Competitors may bring pre-built robots to the competition.

## D. Field Setup and Specification

The competition field is based on a circular white surface with a black outline. The diameter of the field is 120 cm, the diameter of the interior white area is 110 cm. The starting line is 20 cm away from the center line on both sides. The width of the black outline is 5 cm. The thickness of the surface is 2 cm and is elevated 6 cm from the ground. Other details including, accessories, dimensions, weight will be prevailed on the day of the competition.



The 「squared brick」 is formed from using 4 「LEGO®2X4 brick」.

