

Rancho Cordova Robotics Competition Game Manual – Precise, Powerful and Prompt

Version 1.1 dated March 22, 2022

This Game Manual will be the single source for all the rules and regulations for the **Rancho Cordova Regional Robotics Competition** scheduled to be held on **May 21st, 2022, at City Hall, Rancho Cordova**. The competition is open to all Rancho Cordova 6-8 grade students.

Materials

- The (LEGO) materials to build the robot will be provided
- No additional materials should be used
- Maximum of 1 Controller or Hub:
 - 1x LEGO® Technic Large Hub for SPIKE Prime or
 - 1x LEGO® Mindstorms Robotics Inventor Hub
- Catalog of the parts: <https://education.lego.com/en-us/products/lego-education-spike-prime-set/45678#in-the-box> & <https://education.lego.com/en-us/products/lego-education-spike-prime-expansion-set/45681>

Robotics Competition

- The competition judges the robot(s) on accuracy, strength and speed and to accomplish that, the competition will be divided into two separate events
 - The first part of the day will be a Line Follower Competition. The goal of this competition is to find the **fastest robot** (→Prompt) that follows a custom racecourse with least number of errors or mis-steps (→Precise).
 - The second part of the day will be a Sumo-bot Competition. The goal of this competition is to find the **strongest robot** (→Powerful) that can push the other robots out of a circular sumo-wresting mat/table (will be called Sumo-bot Ring from now on) while it remains within the Ring.
 - Each team can build ONE modular robot that can be quickly modified to participate in both events.
 - By essentially providing two different set of conditions and a limited number of parts, we want to encourage the teams to think in terms of **modularity, adaptability and strategy**.
- **Line Follower Competition:** The robot has to be built with one or two color sensor(s) to follow a custom line drawn on a 4 feet x 8 feet mat.
 - A sample line follower mat will be made available on February 09 2022
 - The fastest time will be given the maximum points
 - Points will be deducted for every mis-step

- **Sumo-bot wrestling Competition:** The robot should be able to stay within a circular mat and push other robots out of this mat area
 - A sample sumo-bot wrestling mat will be provided on February 09 2022
 - The least time to push the other robot will be given the maximum points

Game Rules

Rule01 The Competition Robot

The Competition Robot and all its accessories should be built from LEGO elements that are provided. No additional materials should be used. Primarily these elements are from

- LEGO® Education SPIKE™ PRIME set (and)
- LEGO® Education SPIKE™ PRIME Expansion set

Rule02 Software

Variants of Scratch and Python are supported by SPIKE PRIME. You can use either the intuitive drag-and-drop coding language based on Scratch or text-based coding with Python.

Rule03 Control of the Robot

The robot should be able to move autonomously (or simply on its own) using the programs that are in the controller hub. Remote control of the robot is NOT ALLOWED. The Robot's Bluetooth and other connections should be turned OFF.

Rule04 Name of the Team and the Robot

Each team should have a name. The team should also name their robot. If the robot does not have a name, the team name will be used in place.

Rule05 Definition of Line Follower Robot

The robot can be programmed to follow a line. The width of the line is <To Be Updated>, and it is drawn in Black on a White background. The robot should be able to accurately follow the line through the straightaways and curves. A simple robot line following course will be provided but the Competition will have a course that is larger and different.

Rule06 Definition of Sumo-bot or Sumo Wrestling Robot

In a Sumo-bot wrestling competition, two robots are in a circular mat/table (or we will call it a Sumo-bot Ring) with black background and white border or white background and a black border. A sample sumo-bot ring will be provided but the Competition will have a mat that will be larger. The sumo-bot should be able to use the color of the border to remain within the Ring while trying to push the opposing robot out of the Ring.

Rule07 Starting Position

The Starting Position of the Robot will be clearly marked on the Line Follower Course as **START**. On the Sumo-bot Ring, the position for the two robots will be marked as **Robot_A** and **Robot_B**. Robot_A will be setup first, followed by Robot_B.

Rule08 Points for the Line Follower Competition

<To Be Updated>

Rule09 Points for the Sumo-bot Competition

<To Be Updated>

<More Rules to Follow>

Frequently Asked Questions (FAQs)

<http://suvidhainternational.org/program-faqs>

A Look at the Day of the Competition

<Need to update Flow of events on Competition Day>

- Registration
- Line Follower Competition
- Sumo-bot Wrestling Competition
- Demo – Drone Racing
- Demo – 3D printers and Drones
- Demo – local Robotics teams
- Awards

Items to be closed in the next couple of months

Line Follower Points Table

| Team Name | Time | Number of Errors | Points |
|-----------|------|------------------|--------|
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Sumo-bot Wrestling Points Table

| Team Name | Time | Result | Points |
|-----------|------|--------------|--------|
| | | Win-Loss-Tie | |
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Variants to consider for final competition:

Duration of the competition:

- 8 hours with Line Follower in the morning and Sumo-bot wrestling in the afternoon
- 4 to 6 hours if needed

Additional activities on the Game Day:

- Drone racing demo – Robot Evolution
- 3-D printers and Drones – Local Makers
- Robotics demos – local FIRST teams

Line-follower:

- 3 different racecourses – Beginner, Intermediate, Advanced
- One or two light sensor(s) – More intelligent programming

Sumo-bot Wrestling:

- Weight-based – need to build sample bots and say that the robots need to be within a given weight category
- Size-based – need to build sample bots and say that the robots need to be within a given size limit

Competition:

- 16 teams?
- 2 groups of 8 teams each
- Can we award teams separately on the Line Follower and Sumo-bot competitions or should we combine both and award top three teams?
- Awards/Trophies?