

3. A-MAZE-ING CHALLENGE

3.1 GOAL

To design, build, and program a robot that can follow a raised wooden maze without falling off. A higher speed of passing through the maze increases the overall score.



3.2 DIVISION

- Teams in this challenge compete in separate divisions:
 - Elementary School (ES)
 - Middle School (MS)
- Teams of 2 to 4 players

3.3 REQUIREMENTS

- Autonomous robot, any platform, costing \$1,500 USD or less, that meets the following design constraints, which will be verified during Check-In:

Type	Specifics
Platform	Not limited
Robot	Autonomous robot
Volume	Not exceed 65030 cubic centimeters. Robot CANNOT be expanded after leaving start position.
Controller	1 Controller allowed
Sensor Type	Robot is not allowed to use any external sensor to assist it in following the maze but wheel encoders are allowed.
Sensor Number	Not limited
Motor type	Not limited
Motor / # of Servos	Not limited

3.4 TRACK

- Tracks are different from ES division and MS division.
- Tracks are constructed of particle wood that is 23.5 cm wide and 3 cm tall.
- There are various lengths with a combination of 45°, 90°, and 135° angled turns in either direction.
- The design pattern changes every year and is revealed on the first day of the event.

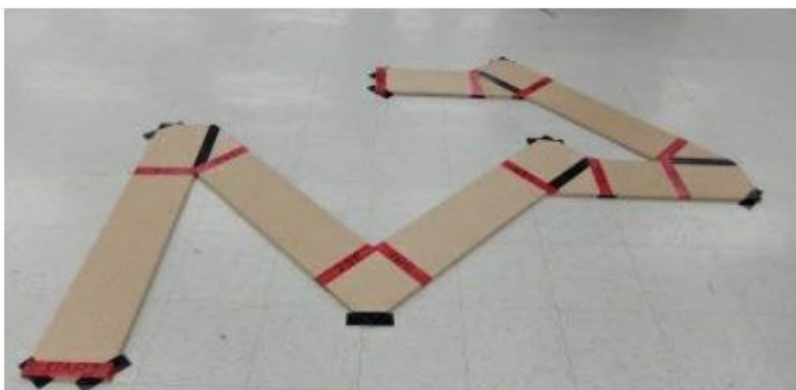


Fig1: A **typical** a-MAZE-ing Track – MS division

3.5 RULES AND SCORING

- A robot has 2 minutes to complete the maze with a counting down of 120 seconds.
- Teams can attempt as many runs as needed to post their best scores. The total of your 5 highest official scores are used to determine tournament selection. The top 8 teams will move on into the challenge tournament.

- Each completed straight-away is worth 50 points, once completed with front wheels touching the scoring zone. Each completed angle is worth 100 points, once completed with front wheels pass over the scoring zone.
- If the robot falls off the track before reaching the finish line, then the run is concluded, and the score received includes any portion of the maze that has been completed in its entirety.
- Time bonus points are awarded, if the robot reaches the finish line in less than 120 seconds. Any remaining time (integer in seconds) is then added to the maze score as a “time bonus” point value.
- A robot is only allowed to touch the upper surface of the track. Touching the side of the track will be counted as fall off the track.

Scoring Matrix

1 st LEG	1 st ANGLE	2 nd LEG	2 nd ANGLE	3 rd LEG	3 rd ANGLE	4 th LEG	4 th ANGLE	5 th LEG	5 th ANGLE	6 th LEG	Total
50	100	50	100	50	100	50	100	50	100	50	800

Time Bonus: In the case of finishing required distance in 120 seconds, remaining seconds (integer part only) are added to the score.

3.6 THOURNAMENT SCORING

- The top 8 teams from each division will compete in the final tournament.
- Teams got same score in the top 8, decision match will be.
- Advancing teams will be seeded into the tournament bracket according to their aggregate score (see bracket below).

“RoboRAVE Kaga Japan 2019” 8 Team Tournament Bracket

Tournament Placing

- The losing teams from Round 1 will place 5th through 8th in accordance with their aggregate score coming into the tournament.
- The losing teams from Round 2 will face each other in Round 3 to determine the 3rd and 4th place winners respectively.
- The winning teams from Round 2 will face each other in the Championship Round (which may be run at the same time as Round 3) to determine the 2nd place winner, and the Tournament Champion.

