



## 2020 a-MAZE-ing Challenge Rules

**Goal :** Design, build, & program a robot that can follow a raised wooden maze without falling off. Completing the maze before the time limit adds Bonus Points to your score.

**Divisions:** Teams entering this challenge compete in Elementary School (ES) and Middle School (MS) divisions. *(Note: If there are fewer than 5 teams registered in either division, the Event Director has the option to combine divisions)*

**Robot:** Autonomous robot, any platform, costing \$1,500 USD or less, and meeting the following design constraints, which will be verified during Check-In.

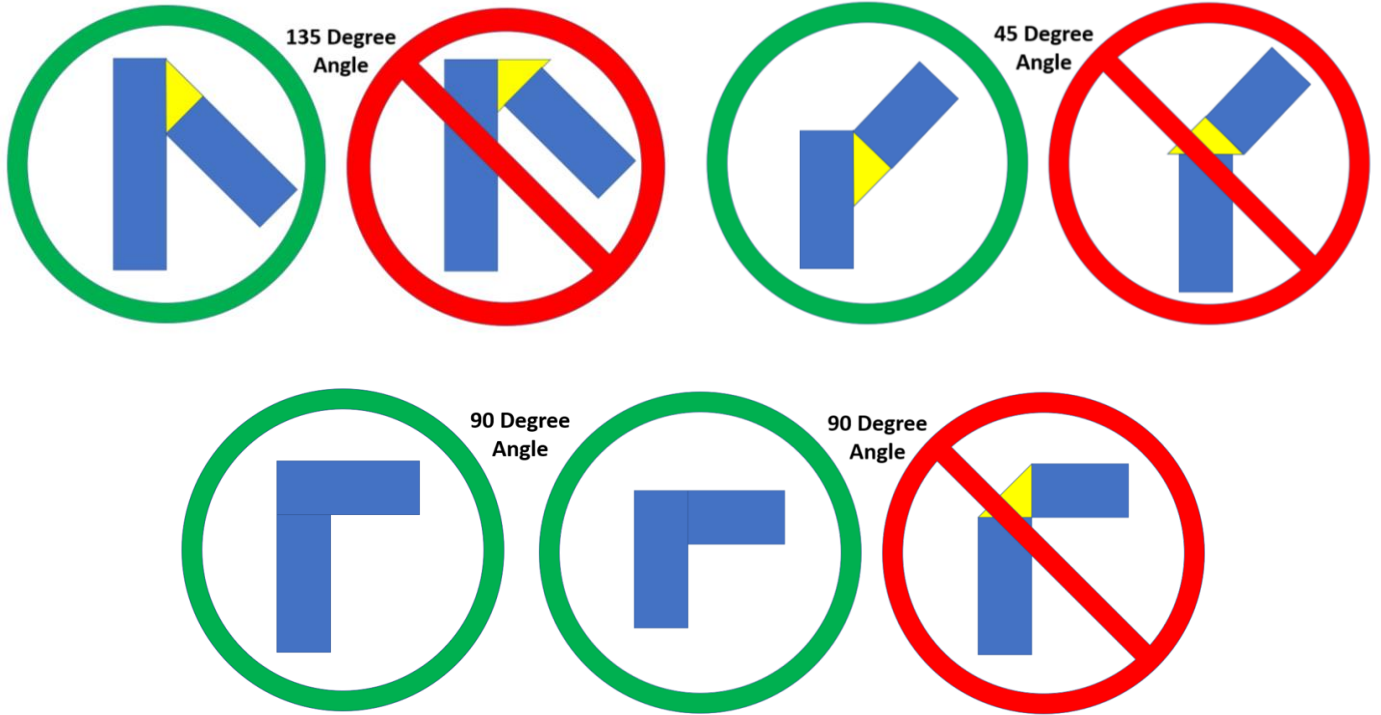
- Robot is not allowed to use any external sensors to assist it in following the maze; however, wheel encoders are allowed.
- Volume of the robot must not exceed 65030 cm<sup>3</sup>.

### General Rules of Play and Scoring:

- The Event Director will establish the number of official runs allowed, and the number of those official runs that will be counted for the aggregate score used to determine the Top 8 teams that will compete in the Tournament.
- The robot has 2 minutes to complete the maze with the clock running backwards from 120 seconds.
- Teams can Practice as much as necessary, taking turns with other teams needing to practice. Should the track be needed to score an official run, practicing teams will yield the track.
- Each completed straight-away is worth 50 points. A straight-away is considered complete when any part of the robot passes over the start of the scoring zone line.
- Each completed angle is worth 100 points. An angle is considered completed when any part of the robot passes over the start of the scoring zone line.
- If the robot falls off the maze before reaching the finish line, and there is time remaining; return it to the start line and attempt to finish the maze.
- A robot is considered to have fallen-off the maze when any of its wheels are **COMPLETELY** off the surface of the maze.
- If the robot does not complete the maze when time runs out, the score will be the furthest completed section of the track.
- If the robot completes the maze before time runs out, the score will be the maximum score for their division, plus a bonus consisting of 1 point for each second remaining.

# Challenge Track Specifications:

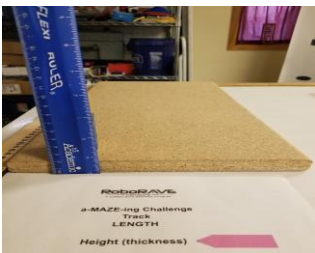
- All a-MAZE-ing tracks will be as near in design as possible, and constructed of particle-board (or a similar locally procured material) that is 24 cm wide and 2 cm tall. There are various lengths with combinations of 45, 90, and 135 degree angled turns in either direction. (Note: All Challenge Dimensions are Approximate).



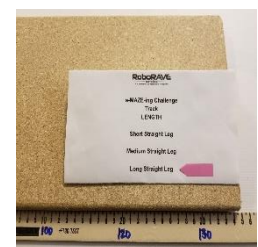
Height: 2 cm

Width: 23 cm

Straight Lengths: 46cm, 76cm, 134 cm



## Triangle Connector 45° - 45° - 90



Hypotenuse 33cm

Legs 23cm

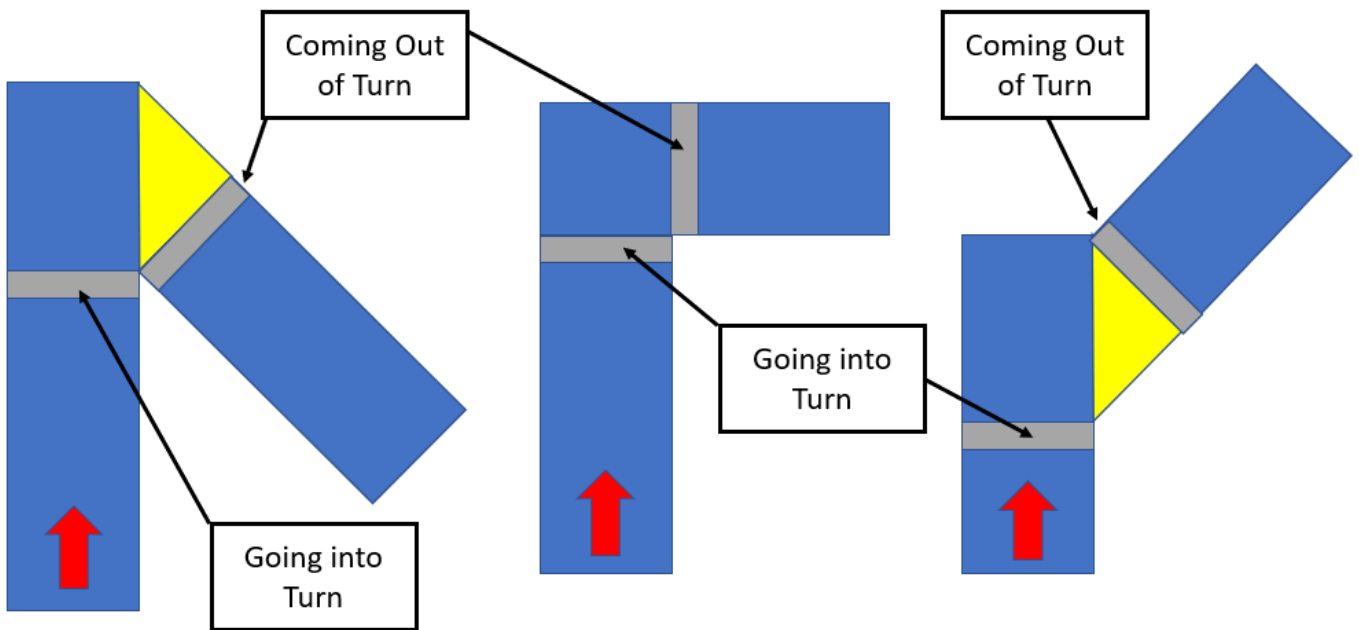
- The pieces are typically taped together with heavy duct tape. However, they could be joined with screws or glued splines. Regardless of the method used, every effort will be made to ensure tracks are as smooth and free of irregularities as possible.
- ES Division has 4 straights, and 3 angled turns for a total of 500 points possible
- MS Division has 6 straights and 5 angled turns for a total of 800 points possible.
- Depending on Event space and material available, both divisions might be run on the longer MS track. In that case, the ES Division Finish line will be located somewhere between the 3rd and 4th angled turn of the MS track.

• Scoring Lines

1. The diagram below shows the placement of scoring lines for each of the three types of angles
2. Mark the start and the finish
3. Label the scoring lines at the end of each straight, and at the completion of each turn from the start to the finish accumulating the scores as you go (this makes monitoring for score very simple).

1 <sup>st</sup> straight	1 <sup>st</sup> turn	2 <sup>nd</sup> straight	2 <sup>nd</sup> turn	3 <sup>rd</sup> straight	3 <sup>rd</sup> turn
50	150	200	300	350	450

4 <sup>th</sup> straight	4 <sup>th</sup> turn	5 <sup>th</sup> straight	5 <sup>th</sup> turn	6 <sup>th</sup> straight	
500 (ES end)	600	650	750	800 MS (end)	



1 **Tournament Scoring:**

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- The top eight teams from each division will compete in the final tournament.
- Ties will be broken based on a PERFORMANCE BASED CRITERIA chosen by the Event Director. (One Example: using the highest individual run score of all the tied teams).
- Advancing teams will be seeded into the tournament bracket according to their aggregate score (see bracket below).



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- Runners Up are used to determine 3<sup>rd</sup> & 4<sup>th</sup> places based on outcome of semi-finals.