



## 2018 a-MAZE-ing Challenge

This challenge concludes in a **single elimination tournament**  
**Top 8 teams** from each division, based on scores, will compete for awards

### Goal

To design, build, and program a robot that can follow a raised wooden maze without falling off. The faster you can complete the maze increases your overall score.

### Who Can Play

Teams in this challenge compete in **separate divisions**, typically:

- Elementary School
- Middle School

### Requirements

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

- Robot can navigate a *46cm* long straight board, 90 degree right, *46cm* long straight board during check in.
- Robot is **not allowed to use any external sensors** to assist it in following the maze but wheel encoders are allowed.
- Volume of the robot must **not** exceed  $65030\text{cm}^3$ .

### General Rules of Play

- The robot has **2 minutes** to complete the maze with the clock running backwards from 120 seconds.
- Teams can attempt as many runs as needed to post their best scores.

### Challenge Specifications

All a-MAZE-ing tracks are identical in design and constructed of particle wood that is *24cm* wide and *2cm* tall. There are various lengths with combinations of 45, 90, and 135 degree angled turns in either direction.

While both divisions will utilize the same track, each division has a different finish line:

- Elementary Division – Finish line will be halfway between the 3rd and 4th angled turn.
- Middle School Division – Finish line will be at the end of the last straight.

*All Challenge Dimensions are Approximate*

### Scoring

- Each completed straight-away is worth 50 points, once completed with back wheels passing over the scoring zone.
- Each completed angle is worth 100 points, once completed with back wheels passing over the scoring zone.
- If the robot falls off the maze before reaching the finish line, then the run is concluded, and the score received includes any portion of the maze that is completed in it's entirety, **but no time bonus** points are awarded.
- **Time bonus** points are awarded, if and only if, the robot reaches the finish line before the 120 seconds ends. Any remaining time (integer in seconds) is then added to the maze score as a "time bonus" point value.
- The averaged score using the top 5 scores that a team posts will be utilized to determine the top 8 teams per division of the a-MAZE-ing challenge.

### Scoring Matrix

	<b>1st Straight Completed</b>	<b>1st Turn Completed</b>	<b>2nd Straight Completed</b>	<b>2nd Turn Completed</b>	<b>3rd Straight Completed</b>	<b>3rd Turn Completed</b>
<b>ES</b>	50	100	50	100	50	100
<b>MS</b>	50	100	50	100	50	100

	<b>4th Straight Completed</b>	<b>4th Turn Completed</b>	<b>5th Straight Completed</b>	<b>5th Turn Completed</b>	<b>6th Straight Completed</b>	<b>Total Score</b>
<b>ES</b>	50	N/A	N/A	N/A	N/A	500
<b>MS</b>	50	100	50	100	50	800

**Time Bonus:** Finished required distance under 120 seconds? Remaining seconds (integer part only) are added to score.

**For example** - a robot finishes the MS track: 800 points for finishing + 35.8 seconds remain. Team score = 800 points + 35 seconds time bonus (integer value only) = 835 points.

## Tournament Scoring

- The top eight teams from each division will compete in the final tournament.
- Advancing teams will be seeded into the tournament bracket according to their aggregate score (see bracket below).

