



Welcome to the Kreativivity League/MechanzO League

Welcome to the thrilling stage of the Kre8ivity League **Finale**! Brace yourself for a Robotic challenge that merges precision, ingenuity, and navigational finesse. Your task, should you seize this opportunity, is to design, construct, and program a drag-and-place bot with the added complexity of navigating through a challenging maze.

Problem statement for Senior Category

Teams are challenged to create a wireless-controlled **Drag-and-Place Maze Solver Bot** with the ability to navigate the maze, and grasp, and relocate objects accurately. The robot must be autonomously pre-programmed and operated using any Arduino controller. Only the use of **Bluetooth or Wi-Fi modules** is allowed for wireless communication, emphasizing the importance of efficient and precise control in this innovative challenge.

Senior Category: Students of grades 9-12 are allowed to form a team

All the best to all participants, and may the most creative team with the maze solver bot win!

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Maze Solver Bot Specifications:

- 1. Size Limits:** The main part of the robot's dimensions must not exceed 30 cm X 30 cm X 30 cm (LxWxH) during the initial inspection, excluding the dragging part but including the wheels. However, the bot can extend its size once the run begins. A tolerance of $\pm 5\%$ is allowed.
- 2. Control Mechanism:** The bot must be autonomously controlled using an Arduino board (any board of Arduino).
- 3. Wireless Communication Integration:** The Maze Solver Bot must incorporate wireless communication modules for remote control. Only a maximum of one Bluetooth or Wi-Fi module is allowed for this purpose.
- 4. Ready-made Assemblies:** Participants are allowed to use ready-made mechanical assemblies in their robots such as MechanzO Kits.
- 5. Disqualification Criteria:** Failure to meet any of the specified requirements will result in immediate disqualification.
- 6. Power Supply:** AC power supply will not be provided or allowed during the competition.
- 7. Weight and Dimensions:**

The robot's weight should not exceed 3kg.
Main Part Robot dimensions must conform to: **Height = 30 cm, Width = 30 cm, Length = 30 cm** excluding the dragging mechanism.
- 8. Wheel Specifications and Restrictions:**

Maximum overall diameter: 8 cm
Maximum width: 2 cm
Omni-directional wheels are not allowed.

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Maze Solver Robotic Competition: Rules and Regulations:

1. Team Composition:

- Teams must consist of a maximum of 3 members.
- Each team is required to appoint a team leader for communication with event organizers or judges.

2. Robot Specifications:

- The robot design should adhere to a maximum size limit of 30 cm X 30 cm X 30 cm excluding the dragging mechanism.
- The robot's weight should not exceed 3kg.
- Only one Arduino board is allowed for programming and control.
- Wireless communication is limited to Bluetooth or Wi-Fi modules.

3. Electrical Specifications:

- The potential difference between any two points on the Drag-and-Place Maze Solver Bot should not exceed 12V.
- The use of pneumatics and hydraulics is strictly prohibited.
- Participants must provide an additional power source for the final built bot used in the competition.

4. Motor Specifications:

- Motors used should be DC motors with a maximum speed of 150 RPM.

5. Assembly and Tools:

- Electric tools are not allowed for robot assembly.
- The Drag-and-Place Maze Solver Bot must incorporate various mechanical components.

6. Wireless Communication:

- Teams must exclusively use either a Bluetooth or Wi-Fi module for wireless communication.
- RC remote controls are not allowed.

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7. Maze and Block Setup:

- The maze will have varying levels of complexity, providing a dynamic challenge.
- Blocks will be placed strategically within the maze.
- The competition arena dimensions will be 243.84 cm X 182.88 cm (LxB).

8. Pre-Programming:

- The robot must be pre-programmed before the start of each round.
- Teams are not allowed to reprogram the robot once the competition has commenced.

9. Competition Rounds:

- Each team will have a specified time to complete the maze-solving and block-placing task.
- Points will be awarded based on completion time, accuracy, and successful block placements.

10. Competition Tasks:

- Negative marking may be applied for errors in the dragging and placing task.

11. Participant Restrictions:

- Teachers and mentors are not allowed in the competition arena.

12. Technical Support:

- Teams are responsible for the maintenance and technical support of their robots.
- Technical issues during the competition will not result in additional time.

13. Code of Conduct:

- Fair play and sportsmanship are expected from all participants.
- Any form of intentional interference with other teams' robots will result in immediate disqualification.

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14. Scoring and Judging:

- Scoring will be based on completion time, placement of block, and other factors.
- Judges' decisions are final and not subject to appeal.
- Any misbehaviour with the judges will lead to the disqualification.

15. Safety Precautions:

- Robots must not pose any safety hazards to participants, spectators, or event staff.
- Teams are responsible for ensuring their robots comply with safety regulations.

16. AC Power Supply:

- AC power supply will not be provided during the competition, and robots cannot use AC power sources.
- Participants must design their robots to operate on alternative power sources such as batteries.
- Maximum battery voltage should be 12v.

17. Allowed & Not allowed:

- The use of Lego kits is strictly prohibited.
- RC remote controls are not allowed.
- Mechanzo Kit or a similar kit for mechanical assembly is allowed.

18. Finale Level Participation:

- To participate at the Finale level, participants must strictly adhere to all rules.

19. Rule Modification:

- **The competition rules are subject to modification by the organizers, so participants are advised to regularly check the competition's official website for any updates.**

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Scoring and Penalties

S.no	Criteria	Points
1	Completion Time <ul style="list-style-type: none"> - Under 6 minutes - Under 5 minutes - Under 4 minutes - Under 3 minutes - Under 2 minutes - Under 1 minute 	25 points 50 points 75 points 100 points 150 points 200 points
2	Drag and Place Points for each block (Total 4 blocks) <ul style="list-style-type: none"> - Perfect placement (Hides the number) - Near-perfect placement (Inside the circle but not hiding the number) - Slight deviation from target (Some parts touch the circle) - Significant deviation from the target (No part of the robot touches the target) 	25 points 15 points 5 points 0 points
3	Incomplete Maze Scoring <ul style="list-style-type: none"> - 50% - 75% completion - 25% - 50% completion - 0% - 25% completion 	15 points 10 points 5 points
4	Time Points for Incomplete Maze <ul style="list-style-type: none"> - Deduct 5 points for every 30 seconds over the time limit 	
5	Misdirection Adjustment <ul style="list-style-type: none"> - Allowed twice during the run Wall Touch Penalty 	-2 points (per instance)
6	Disqualification Points <ul style="list-style-type: none"> - Immediate disqualification 	
7	Miscellaneous	

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Arena Specifications

- The outer dimensions of the arena are 243.84 cm X 182.88 cm (LxB).
- The block dimensions are 7.62 cm x 7.62 cm x 7.62 cm (LxBxH).
- Drop section dimensions are 7.62 cm x 7.62 cm (LxB).
- Block weight is less than 100 grams.
- Checkpoints are not available.
- Dragging sections are indicated by squares with numbers 1-4.
- Drop sections are indicated by circles with numbers 1-4.

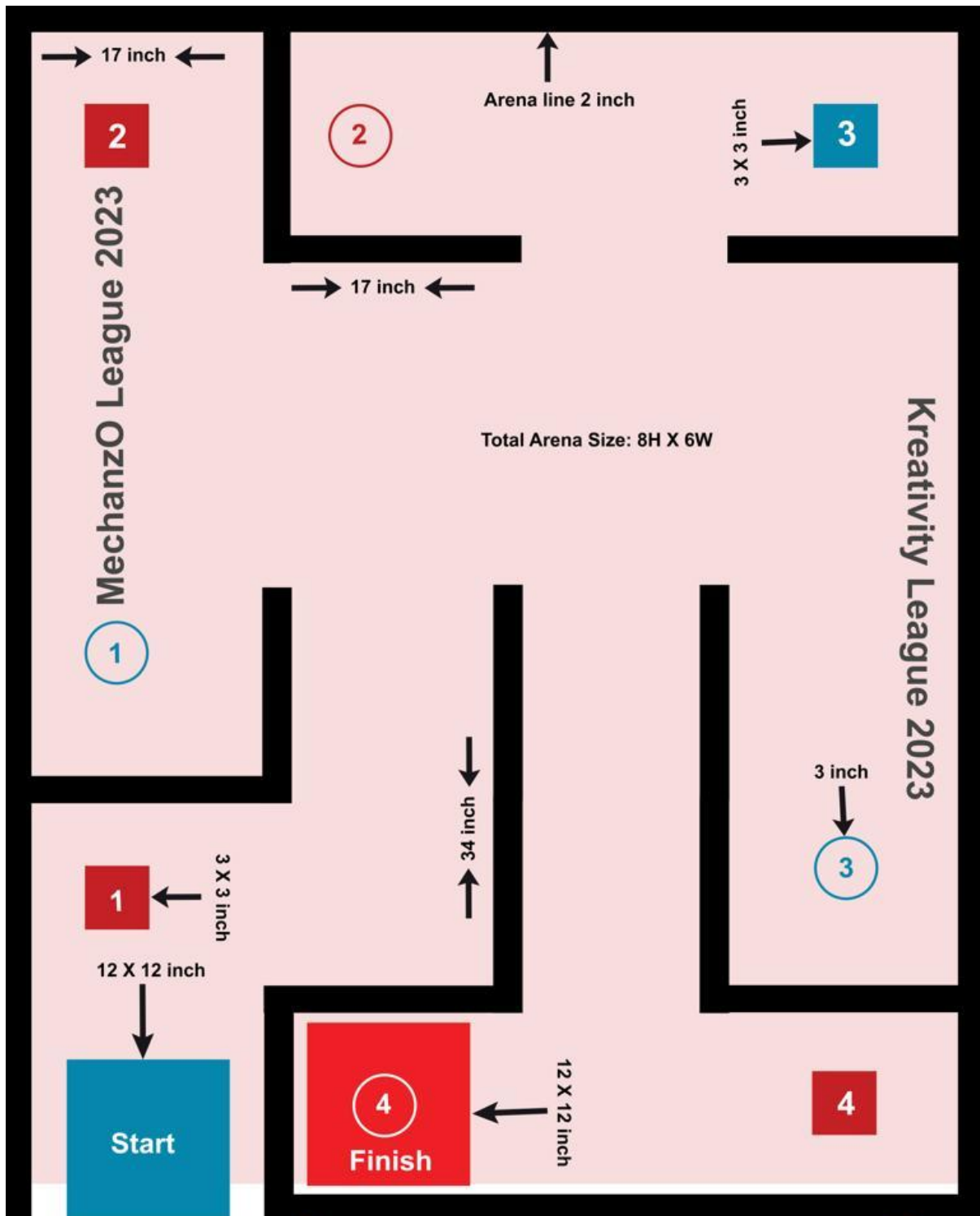
Note: The above dimensions may vary during the competition.

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Note: The above image is just for representation and it does not resemble the actual arena.

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Gameplay for Drag and Place Maze Solver Bot Competition

1. Teams and Setup:

- The game is played by one team at once.
- Prior to the competition, the robot is positioned at the starting point in the maze.
- The competition officially begins upon the judge's signal.

2. Objective:

- The robot's primary task is to navigate the maze efficiently.
- It must drag the blocks from designated square pick sections.

3. Game Rules:

- Robots must avoid touching the Wall while moving.
- Teams aim to complete the challenge in the least amount of time feasible while avoiding rule violations.

4. Block Placement:

- The robot is required to carry the blocks and precisely place them in corresponding circular drop sections.

5. Winning Criteria:

- To secure victory, the team must successfully navigate the maze, placing all four color-coded blocks into their allocated circular drop locations.
- After successfully placing the final drop, the robot should proceed to the finish point to complete the maze.

6. Miscellaneous:

- Additional points may be awarded at the judges' discretion for exceptional achievements or strategies.

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7. Winner Determination:

- The team with the highest total points, considering completion time, object placement accuracy, design and innovation, and miscellaneous achievements is declared the winner.

8. Post-Game Discussion:

- Teams have the opportunity to discuss their strategies, share insights, and receive feedback from the judges.

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