

JUNK BOX WARS

Magnificent Marble Maze

Create a marble maze using the materials in a box of junk!

Competition Rules:

Your team will be provided with a junk box filled with materials that could be used to create your maze. Each team will receive only one set of materials. Teams may use all or part of the materials in their junk box and are not allowed to share materials with other teams. All unused materials should be saved in case repairs are needed during competition.

Teams will be allowed time to build and test their mazes. Competitors are allowed to bring diagrams to help them build their maze. After the time is up, all mazes will be impounded and no changes will be allowed.

Maze Requirements:

Your maze must be created on one piece of poster board. Teams are allowed to use a wall or table leg to support their maze. The maze may not be attached to the supporting structure.

The maze must incorporate at least 50 design points. Points will be awarded for different design elements such as ramps, hills, spirals, and loops.

The marble must enter the maze at point A located less than 5 cm from the top left corner of the poster board. The marble must exit the maze at point B located less than 5 cm from the bottom right corner of the poster board. The marble must stop at the end of the maze!

Testing Procedure:

Each team will be provided with a standard marble (between 12-17 mm in diameter) and allowed 5 minutes to prepare for the first trial. Teams will be allowed 10 minutes between trials to make repairs using the remaining materials in their junk box. No new construction or major design changes are allowed once competition begins.

The longest time out of the two trials will be considered for the final results. If the marble falls out of the maze, no points will be awarded for that trial. If the marble becomes stuck during the race, teams will be allowed to restart the marble with a "gentle" push. Each push will receive a 5 second penalty subtracted from their trial time. The timer will be stopped each time the marble stops!

Scoring:

The team with the longest trial time will be declared the winner. The maze with the most design points will be declared the winner in case of a tie.

Junk Box Possible Supplies

Straws
Spools
Film canisters
Paper towel rolls
Rubber bands
Milk cartons
Masking tape
Index cards
Paper
Pipe cleaners
Hot glue
Styrofoam cups
Wooden craft sticks
Poster board

Event Score Sheets



Magnificent Marble Maze

Team Name: _____

Team Members :

Maze Requirements:

- Yes No Maze has starting and ending points in correct locations
- Yes No Maze has at least 50 design points

Design Elements

Ramp _____ x 5 = _____
Hill _____ x 7 = _____
Loop _____ x 8 = _____
Spiral _____ x 10 = _____
Total = _____

Trial 1:

Time = _____ s

Trial 2:

Time = _____ s



Magnificent Marble Maze

Team Name: _____

Team Members :

Maze Requirements:

- Yes No Maze has starting and ending points in correct locations
- Yes No Maze has at least 50 design points

Design Elements

Ramp _____ x 5 = _____
Hill _____ x 7 = _____
Loop _____ x 8 = _____
Spiral _____ x 10 = _____
Total = _____

Trial 1:

Time = _____ s

Trial 2:

Time = _____ s



Magnificent Marble Maze Teacher Notes

Recommended Supply List:

- 100 Straws
- 5 Spools
- 5 Film canisters
- 20 Rubber bands
- 10 Paper towel rolls
- 2 Milk cartons
- 500 cm of masking tape
- 25 Index cards (3 x 5)
- 5 Pieces of paper
- 30 Pipe cleaners
- 5 Hot glue sticks (with glue gun)
- 5 Styrofoam cups
- 100 Wooden craft sticks (Popsicle sticks)
- 1 Large sheet of poster board

Notes:

(1) Students may use all or part of the materials in the junk box. For example, if any of the materials come in wrappers or boxes, teams may use those for the device. The materials may be modified with the understanding that if a goof is made they will not receive new materials. Leftover materials may be used to make repairs if the device breaks during competition. No major design changes are allowed!

(2) Marble mazes must be created on the poster board, but may extend out from the flat surface. Teams will have to be careful not to add too much weight or extend the maze too far and cause the maze to tip during competition. The maze may be leaned against a wall or table leg and cannot be supported by team members during the competition. Teams are not allowed to attach the maze to the wall, table leg, or other supporting structure.

(3) Design elements must be separated into sections. For instance, two spirals separated by a ramp would be counted as three different design elements. A continuous spiral would be counted as one design element.

(4) During the trial, the timer must be stopped if the marble stops moving. Teams are allowed to "gently" push the marble to get it moving again. Teams are not allowed to give it a good boost!

NOTE: This project will be challenging for your students. You may want to provide sample marble mazes, such as those available at toy stores.