



ROBOTICS CHALLENGE

Challenge Description

“Obstacles Challenge”

Design and construct a robot capable of removing 4 randomly placed, weighted obstacles from a level surface (2' circle). The robot will have up to 2 minutes to clear as many of the objects off of the field as it obstacles.

Specifications

Challenge starts at different locations depending on level of difficulty.

- Robots must be made with LEGO Mindstorms Robotics Invention System and be programmed with Robolab programming environments.
- Robots can consist of a maximum 1 RCX, 8 Wires, and 3 motors.
- Nothing can be added or removed from the robot during a round.
- No non-lego parts are allowed
- Challenge is maximum 3 minutes long
- Maximum robot length is 8 inches. Maximum width is 4 inches. Larger parts may outstretch from the robot during play.

The playing surface will be a 2' circle on a white surface. The perimeter of the square will be indicated with a thick black line. The objects to be cleared will be weighted obstacles located at random on the playing field (placed randomly, but consistent between groups). All parts of the robot must be behind the line at the start.

The obstacles are cubes or round objects about 8 cm tall.

Robot maximum dimensions are 6.5” x 4.5”.

Adaptations

Difficulty Levels:

- Level 1 - With the robot starting *inside* the circle, remove/push the obstacles to the outside of the circle.
- Level 2 - The robot starts inside the garage facing the circle, then enters the circle and proceeds to remove/push the obstacles outside of the circle.
- Level 3 - The robot starts inside the garage but facing away from the circle. The robot must turn around inside the garage, find the circle and then enter and remove the obstacles.
- Level 4 - The robot starts as in Level 3, but must make a sound each time an obstacle is removed from the circle.
- Level 5 - The robot starts as in Level 3, but must not simply remove the obstacles. Instead the robot must return the obstacles to the garage.
- Level 6 - The robot must complete Level 5 challenge plus count the obstacles returned to the garage.

Scoring

100 points will be awarded for clearing ALL obstacles from the ring at each level. In order for obstacles to be considered to be clear, it must be outside of and not touching any of the black lines.

The final score is the total points plus 5 points for each difficulty level. (So, level 1 is worth 105, level 2 is worth 110, etc.)

Up to 25 points will be deducted from the total score for the total amount of damage sustained by the robot, as determined by the judge.

To score, the barrel(s) must be moved completely outside the barrier line.

-10 points each time robot falls off the playing area

The team may **not** pick up the robot at any time during the trial.

Hints and Tips

Use a light sensor to note when the circle has been crossed.

Try working your way through the levels of difficulty instead of just trying for the highest level. The lower levels are really training missions for the higher.

Pictures from around the web:

