# G-2

# Troublemaker VS Cleaners

**SCENE**

A naughty boy is the troublemaker. He is playing beside apartment garbage bins. He wants to make fun and troubles of the cleaner by knocking over those garbage bins. Garbage is scattered everywhere. Now, the cleaner will have to collect the garbage back to the place, but he has very limited time because the garbage truck is coming closer.

**DESCRIPTION OF THE ARENA**
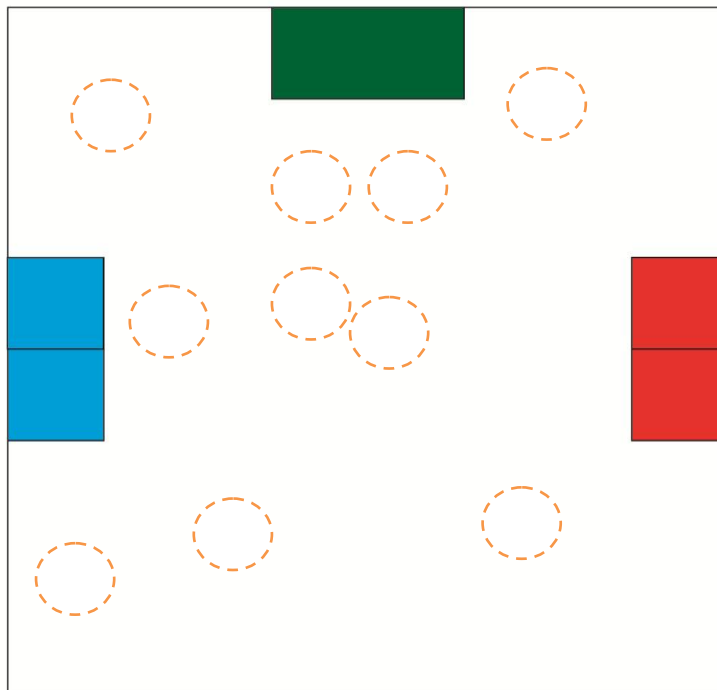
1、 The surface is 300 cm × 300 cm, or 12ft × 12ft. The area is fenced with board of 20 cm in height.

2： There are 4 zones in the arena. Each zone is marked by a different color.

- Green zone: 40cm ×80cm, is the garbage collection area. Cleaners need to move the

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scattered garbage back to the green zone

- Red zone: 40cm ×80cm, is the launching area 1
- Blue zone: 40cm ×80cm, is the launching area 2
- White zone: 10 balloons will be placed randomly in this area by referees prior to each round.

## DESCRIPTION OF THE MISSION

- The garbage bin is represented by 10 balloons. Each balloon contains 5 pieces of garbage which are represented by 2 by 2 pin LEGO bricks.

- The trouble maker needs to drive his robot and try to puncture all balloons. Meanwhile, the cleaner need to move the scattered garbage to the green zone.

- Two robots per team. One robot will be the troublemaker while another robot plays the role of the cleaner. The troublemaker will attempt to scatter more garbage for the cleaner from the other team.  In the next round, team members of the same team switches roles.

## DESCRIPTION OF THE ROBOT

One can use any types of robotics kit, but the robot must match the following criteria:

- Length * Width*Height must not exceed 40 cm * 40 cm * 40 cm

- No more than 4 motors in each robot

- Robots must be remote control, but allowed for autonomous parts for popping balloons or collecting garbage.

- Spike(s) (for popping balloons) cannot exceed the length of 2.5cm. The length of a spike is the length of a spike extending out of its holding device.

## DETAILED DESCRIPTION OF THE CHALLENGE

- Prior to the start, team A's troublemaker and Team B's cleaner draw for the starting area: red zone or blue zone.

- Each round is 300 seconds for the troublemaker and 300 seconds for the cleaner. For the troublemaker, the clock will start once he leaves from the launching area. For the cleaner, he can leave the launching area once the troublemaker pops the first balloon, and his clock will start simultaneously.

- Physical contact is not allowed.

- The trouble maker needs to go back to his launching area once his time is up or he has popped all the balloons.

- The troublemaker's clock will be paused only in the following scenario:

  - ➢ The robot is tipped over of stops working by physical contact initiated by the cleaner.

- The cleaner's clock will be paused in the following scenario:

  - ➢ All the scattered garbage has been pushed to the green zone while the troublemaker is trying to pop the next balloon. The cleaner's clock will resume timing once the troublemaker pops a new balloon.

  - ➢ The robot is tipped over of stops working by physical contact initiated by the troublemaker

- The cleaner robot and troublemaker robot are allowed to be touched or moved for repairing by the correspondent player under the circumstances of the robot is tipped over of stops working by physical contact initiated by the opponent only.

- Two rounds with same opponent

| Challenge step by step | |
|---|---|
| **Troublemaker** | **Cleaner** |
| Draw for launching area (Red or Blue) | |
| leaving the launching area, clock starts timing | waiting for the troublemaker to pop the first balloon |
| Has popped the first balloon, trying to pop the next | leaving the launching area, start cleaning; clock starts timing |
| popping balloons | cleaning the garbage by moving them to the green zone |
| popping balloons | All garbage in the arena has been moved to the green zone. cleaner is in idle mode. Cleaner's clock paused.* |
| has popped another balloons, new garbage released. | start cleaning again, cleaner's clock resumes timing |
| 300 seconds is up or finishes popping all the balloons, the troublemaker is back to the | continue cleaning |

| | |
|---|---|
| launching area | |
| | time is up or finishing cleaning all the garbage left in the arena, cleaner is back to the launching area |
| counts number of garbage released | counts number of garbage left in the arena |

*In the scenario of robot stop working or tipped over caused by opponent, one is allowed to repair or reposition by hands until the robot resume functional. Meanwhile, the clock will be paused.

### SCORING

| Troublemaker | |
|---|---|
| **Scoring** | |
| | Points |
| Successful release 1 piece of garbage inside the arena. If the garbage fly out of the arena, points won't be counted | 2 |
| **Penalty** | |
| Hit opponent intentionally | -10 |
| Touch any robot during the game | -10 |
| **Cleaner** | |
| Initial points: | 100 |
| **Penalty** | |
| Left 1 piece of garbage inside the arena when time is finished | -2 |
| Hit opponent intentionally | -10 |
| Touch any robot during the game or hit opponent intentionally | -10 |
| **Total score of each team** | |
| Team score = troublemaker + cleaner | |