

# RobotChallenge – Puck Collect Rule

Revised September 15, 2025

**Introduction:** A 3-minute match where two robots start from their respective red or blue base, collect hockey pucks scattered across the field by any means, and return to their own red or blue base. Points are recorded based on the number of pucks matching the base color returned to their own base, determining the winner.

**group:**

- A. Junior
- B. Senior
- C. Adult

## 1 Robot Requirements

### 1.1 Dimensions and Weight Restrictions

The maximum inspection dimensions for the robot are 50cm x 50cm. There are no restrictions on weight or height. If the robot fails the dimension inspection after debugging concludes before the match, a maximum of 3 minutes is allowed for structural modifications.

### 1.2 Robot Equipment

There are no restrictions on any robot equipment used in the competition.

## 2 General Requirements

### 2.1 Field Dimensions

The competition field dimensions are 250cm x 250cm, surrounded by barriers of any color with a minimum height of 8cm. Figure 1 shows the field layout, and Figure 2 shows a 3D rendering of the competition field.

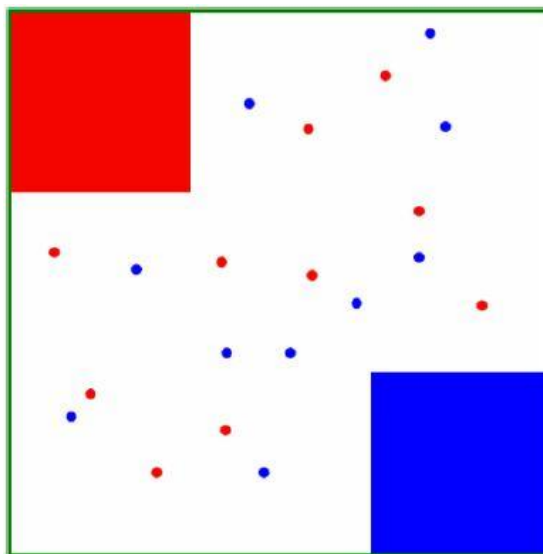


Figure 1: Example Puck Collection Competition Layout

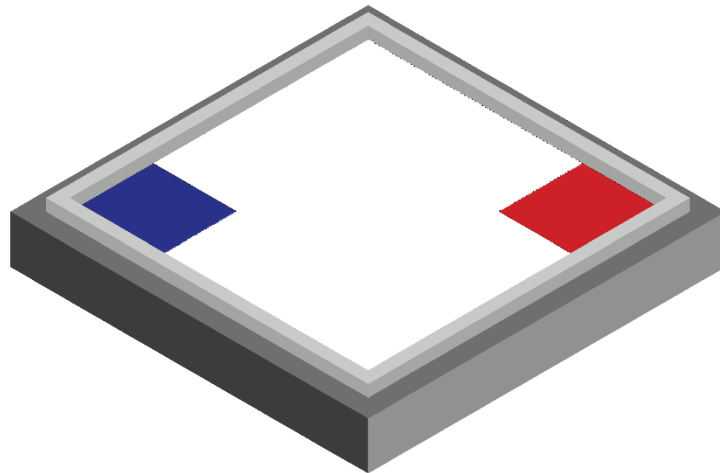


Figure 2: Example 3D Field Map for Puck Collection Competition

## 2.2 Bases

Base size is 70cm x 70cm (Red base, approximately RAL 3024 "Luminous Red"; Blue base, approximately RAL 5013 "Cobalt Blue"), placed in opposite corners of the field. The remaining area is white and is the scattering zone for pucks at the start of the match.

## 2.3 Hockey Pucks

There are 10 red and 10 blue hockey pucks on the field, randomly distributed in the white area before the match starts. Pucks are made of acrylonitrile plastic (40mm diameter, 20mm height) with slightly rounded edges (if making your own, 3D printing is recommended).

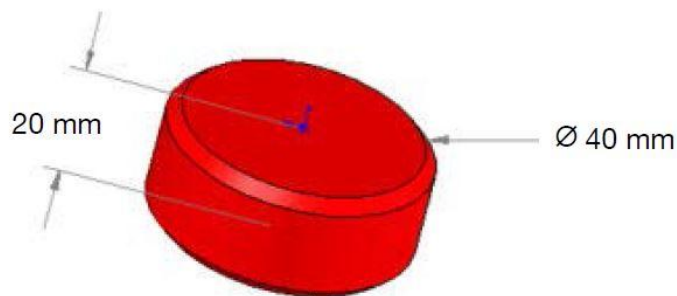


Figure 3: Example Hockey Pucks

# 3 Competition Rules

## 3.1 Competition Format

- A. Automatic grouping before the competition, round-robin group stage, advancing to knockout stage. Each match lasts 3 minutes. Scores are tallied at the end. The winning team receives 3 points for the match, in a draw both teams receive 1 point each, the losing team receives 0 points. After the round-robin stage, rankings are determined based on group points to decide which teams advance to the knockout stage.



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- B. If ranking for advancement is involved and teams are tied on points, a group playoff is required (Marker 1).
  - a. Advancement is determined based on the head-to-head result between the tied teams.
  - b. If the head-to-head result between the tied teams cannot determine advancement, a playoff match is required.
    - a) The advancing team is determined by the result (points) of the playoff match.
    - b) If the playoff match ends in a draw, the referee will award the advancement spot to the team that scored first during the match. If the playoff match ends in a draw but both teams have negative scores and no positive points, the referee will determine that the team which received the first negative score (i.e., conceded an opposing puck first) does not get the advancement spot.
    - c) If neither team scores or loses points during the playoff match, the referee will base the decision on the number of pucks collected inside the robots at the end of the match, with the team having the higher count advancing.
- C. Knockout Stage: Each match also lasts 3 minutes. The winning team advances to the next round.
  - a. There are no draws in the knockout stage. Methods for determining the winner refer to the tie-breaking procedures outlined in Marker 1 - Group Playoff Tie-breaker.

### 3.2 Match Start

- A. Robots that pass inspection are held in a common isolation area.
- B. Before each match, the two team captains draw lots to determine base color. Teams retrieve their robots from isolation and place them in the base corresponding to the drawn color.
- C. Once both robots are placed, programs cannot be modified and robots cannot be moved. The referee randomly scatters 10 red and 10 blue pucks in the white area of the field.
- D. After the pucks are placed and confirmed, the referee blows the whistle, both robots are started, and the match begins.

### 3.3 Match Objective

Collect hockey pucks from the field, bring them back to one's own base, and release pucks matching the base color so they remain within the base, detached from the robot. The referee scores based on puck color.

### 3.4 Scoring

- A. A puck is considered collected when the following conditions are met:
  - a. The entire main body of the puck is stationary within any base for more than 1 second;
  - b. The puck is in contact with the base floor;
  - c. The puck is completely outside the vertical projection of any robot and is not covered by any part of a robot.
- B. Pucks entering a base must be quickly retrieved by the respective teams and placed



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outside the field perimeter. The referee will determine if the puck was validly scored. If invalid (judged based on clause A), it will be randomly placed back on the field. At the end of the match, the referee scores based on the base color, as follows:

- a. If the puck color matches the base color, the score increases by 1.
  - b. If the puck color does not match the base color, the score decreases by 1.
- C. Whether a puck is brought to the base by one's own robot or pushed to the base (intentionally or unintentionally) by the opponent's robot, as long as the puck is completely outside the vertical projection of any robot and remains stationary within the base for more than 1 second, the referee will attribute the points added or subtracted to the team whose base color matches the base where the puck ended up.
- D. **Final scores are allowed to be negative, and the winning side can still be determined based on this score.**

### 3.5 Match End

The match ends when all pucks have been collected. The team with the higher score is the winner.

### 3.6 End of Timing

The match ends after 3 minutes, or if the referee, in consultation with both teams, determines that the match can be ended early based on the situation on the field.

## 4 Raising Objections

### 4.1 Raising Objections

- A. No objection to the referee's decision.
- B. If there is any lack of understanding during the application of the rules, the team captain may raise an inquiry with the referee.

## 5 Flexibility of Rules

If the concepts and foundations of these rules are adhered to, the rules should be flexible enough to accommodate changes in the number of participants and the content of the competition.

## 6 Liability

- A. Participating teams are always responsible for the safety of their robots and for any incidents caused by their team members or robots.
- B. The RobotChallenge organizing committee and its personnel cannot be held liable for any incidents caused by participating teams or their equipment.