



SETTING THE SCENE

Your city of the future has obtained one of the concessions in the new Canadian Hockeybot League, in which the players are robots.

You were recruited to develop and train the player-robots that will represent your city. Your players will have to show their skills puck-handling, passing and scoring during a game that will end with a shootout.

GENERAL FUNCTION OF THE ROBOT

You will need to design robots allowing you to play hockey as a team. Each team will develop 2 robots representing offensive players. Robotics Zone01 will provide the goalkeepers. There will be 6 players on the playing surface. Offensive players will be remotely controlled while goalkeeper will play independently.

The objective is to score goals in the opponent's net by shooting the puck there. Players must move on the surface to retrieve the puck, pass and shoot on goal.

Sometimes robots might come into contact. However, the contact must not be the result of a deliberate act to hit the opponent. If that is the case, a penalty will be awarded.

Robots must move the puck by handling it with the stick. Trapping the puck to move it is not allowed.

Since the forwards are remotely controlled, they can be designed with a minimum number of sensors. The goalie, on the other hand, will be equipped to follow the action itself.

Puck handling will be highlighted particularly during the shootout when each player will have a chance to try to outsmart the opponent's goalkeeper.

DESCRIPTION OF THE ROBOT

The dimensions of robots participating in this challenge must not exceed the following limits:

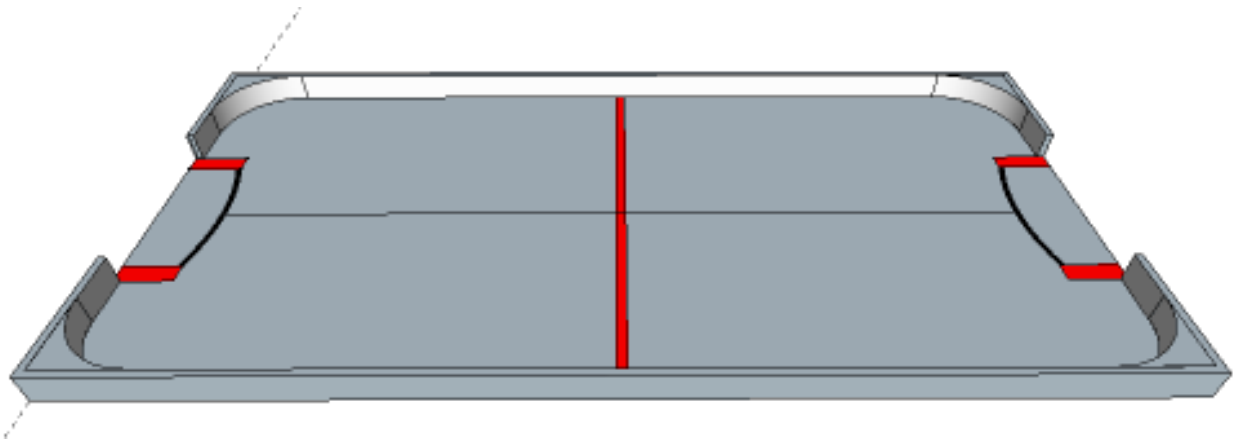
- A. Length without the stick: 20 cm
- B. Width without the stick: 20 cm
- C. Height: no limit
- D. Mass: no limit

The robots must use Zone01 model regulation sticks for the challenge.

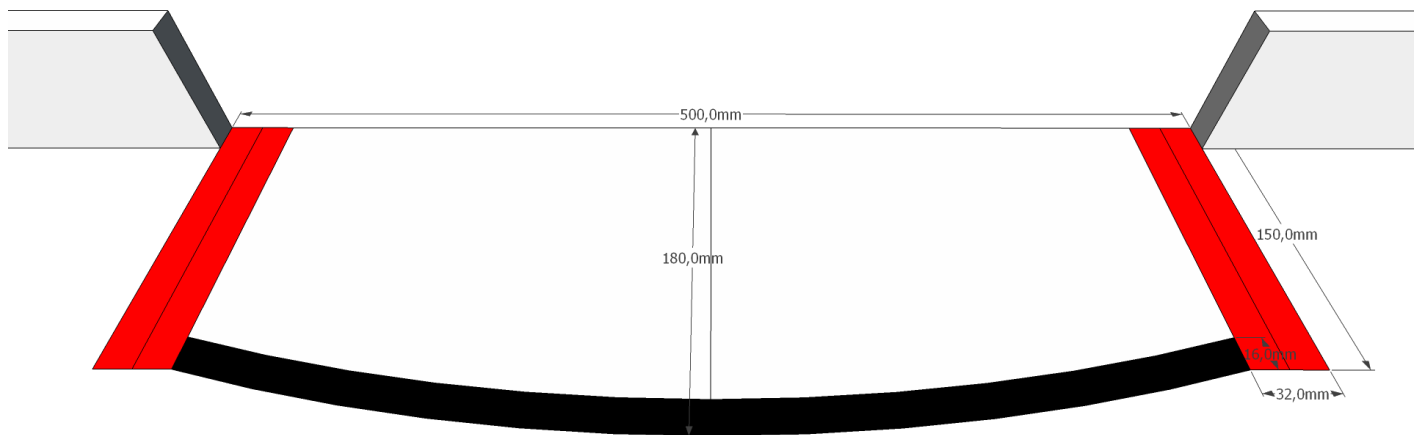
DESCRIPTION OF THE ACCESSORIES :

a. Rink

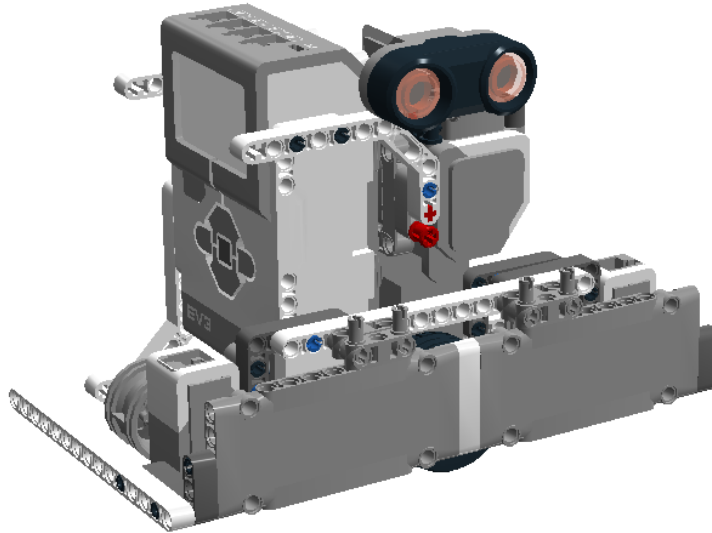
The rink is made with a 4 X 8 foot table surrounded by boards about 7 cm high. Rounded corners are optional.



Since the robots are remote-controlled, exact dimensions are unimportant for the preparation of the challenge in the classroom. The goals will be made of two openings (50 centimeters wide) at each extremity of the rink. The playing surface may be somewhat different during the Zone01 competitions.



Lines will serve as reference points for the independent goalkeeper provided by Zone01.



Goalie assembly instructions and program are available on the Zone01 website.

b. Puck

Since offensive players are controlled remotely, the puck contains no integrated tracking device. It is made of 3 pieces (2 gear wheels and an axle).



c. Sticks

The sticks must be held by the player by the top part (first 9 holes on the top beam). The bottom part should not touch the player and must not be altered.

d. Permitted remotes

Several types of remote control are permitted:

1. An EV3 or NXT brick with Bluetooth communication
2. A phone or tablet
3. A [Mindsensors PSP-NX](#) communication module with the Mindsensors remote control or a PlayStation remote control.



DETAILED DESCRIPTION OF THE CHALLENGE

Time allowed
3 periods of 60 seconds and a shootout
Programmation : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Design : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Stratégie: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Recommended hardware
The game
The idea of this challenge is to score more goals than the opponent and avoid penalties
1. Teams present themselves with their robots, which they set on the playing surface. Zone01 installs a goalkeeper for each side. Offensive players position themselves for the faceoff at centre.
2. The goalkeepers are sent in operation, then the judge conducts the faceoff for the first period.
3. The players try to get the puck, make passes and score a goal.

4. When a goal occurs, the judge resumes the game in the central area.

5. Once the period is over, the game stops and then resumes in the same way for a second period, and then for a third time. Teams change sides after each period.

6. Once the 3 periods are completed, the shootout (1 player against a goalie) takes place. In turn, each player has 10 seconds to take his shot. The offensive player cannot enter the goal crease. The goalie remains in standalone mode. A shot is considered completed if the puck enters the goal crease, crosses the goal line, goes in the goal, hits the goalkeeper or when the 10 seconds are up. Each player is allowed 1 shot.

7. Penalties: If a robot intentionally hits another robot, enters the goal crease when the puck is not there or delays the game by trapping the puck, a penalty will be awarded. During the penalty, the player must drop the remote control associated with the penalized robot.

SCORING

1 point per goal scored in the opposing net	
1 point to the opponent if a player scores into his own net	

PENALTIES

Roughness (intentional contact with another robot)	20 seconds
Obstruction (blocking the way of a player who doesn't have the puck)	20 seconds
Goalkeeper interference (entering the goal crease when the puck is not there) (entering into contact with the goalkeeper)	20 seconds
Delay of match (trapping the puck when not a goalkeeper)	20 seconds

If a team is scored on when one of its players is serving a penalty, the goal cancels the penalty.

SUGGESTED STRATEGIES

Practice remotely controlled movements and puck handling

FAQ

As the season progresses, questions and clarifications are made to the challenge. Do not forget to check out the FAQ below.

Q1: Can the stick be held flat on the ground?

Answer: The position of the stick is not specified. However, the robot may only hold the stick using the 9 holes of the upper beam (see photo of the the stick).

Q2: What is new in version 1.1?

Answer: The rink and goalie area dimensions have been added. The goalie building instructions and program have been added. Penalty durations have been adjusted to 20 seconds.

Q3: During the shootout, can the robot move on the rink? Is the shoot made autonomously?

Answer: The puck is placed in the center of the rink. The player starts from his zone. He can move with the puck and shoot or shoot directly. The shoot may be executed using the remote.

Q4: If a player loses its hockey stick, does he have to go back to a specific area to get it reinstalled?

Answer: If a player loses its stick or is too damaged to play, the operator needs to ask referee permission to take it back for repair. Only when permission is granted the operator can take back the robot and repair it.