



One Minute Game

Hit the Ball robot

JUNIOR

GAME RULES



Section 1 About participants

Article 1

- 1.1 There is one participant per team.
- 1.2 Every team may or may not have teacher/mentor by each team must have only 1 person (1 teacher or mentor can supervise multiple team).
- 1.3 Each participant can play only one team.

Section 2 Playing field pattern

Article 2 Playing field

- 2.1 The playing field is flat but may have joints less than 3 mm. in height and the field size is 120 x 120 cm. There are path lines as shown in Figure 1.
- 2.2 The black line wide around 2.5 cm.
- 2.3 There are 4 ping-pong ball stands at the end of each line.

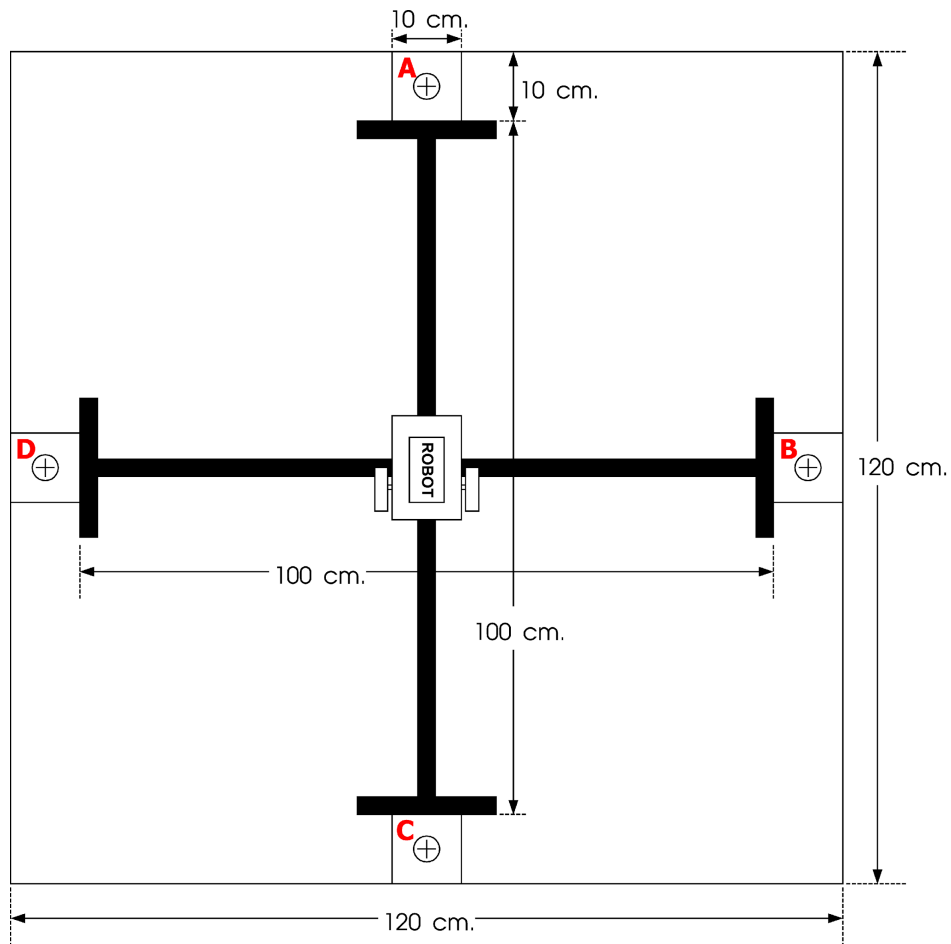
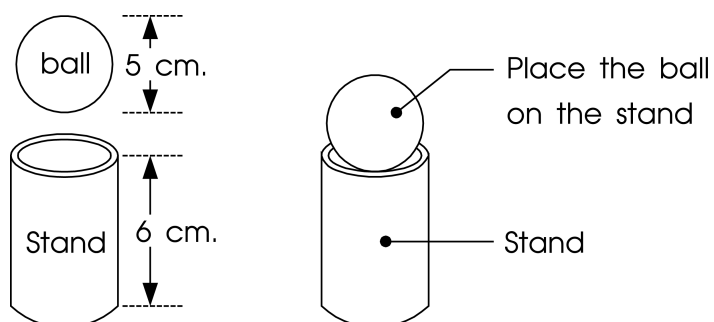


Figure 1 : The playing field of the Hit the ball game.

Article 3 Specifications of the ball stand and the ball

- 3.1 Height is more than 6 cm.
- 3.2 It can place 1 ball without rolling.
- 3.3 The position of placing the ball is in the center of the stand.
- 3.4 The ball is a ping-pong ball. Diameter is between 3.5 to 6 cm.
- 3.5 Allow any color.



Article 4 Lighting and magnetic conditions

Team must prepare the robot to work under lighting conditions in the playing field which the lighting condition may differ in the competition.

Section 3 Robot requirements

Article 5 Technical features

- 5.1 The robot size must not exceed than 20 x 20 cm. No height limit and it must be placed in a rectangular box within 20 x 20 cm. that the referees have prepared before the competition.
- 5.2 Any type of wheeled robot is allowed. For microcontroller rules, the sole decision rests with the individual country representative or the committee in the absence of a country representative. Please contact your individual country representative/committee for more information.
- 5.3 The number of movement motor maximum is 4 included the ball hitting mechanism motor.**
- 5.4 The number of sensor maximum is 4 and no limit of any sensor type.**
- 5.5 The playing robot must be programmed to work automatically. Participants must be prepared to deal with any possible radio waves or infrared light during practice and competition.
- 5.6 Robot cannot be separated or expanded while playing the game.
- 5.7 No limit on the source of all mechanical parts and accessories. It can be hand-made, formed from 3D printer, or modified from toy.
- 5.8 Fixing screws and nuts or any fixation component in the robot must be securely firmly. If during the playing have any piece dropped or broken onto the playing field, the referees will not remove it and allowed to continue the competition. Referees cannot hold responsible for consequences during removal of a loose piece from the playing field.
- 5.9 No limit for the computer properties used to program the robot.
- 5.10 No limit for power supply features.

Article 6 Hitting the ball

The robot must check the conditions on the playing field to ensure that where is the point of hitting the ball. If the robot hits the ball fall out of the stand, team will get score.

Article 7 Prohibition of making the robot

The robot must not be installed any parts or equipment that can any way damage the playing field.

Section 4 Mission

The robot moves from the starting point at the middle of the playing field at the intersection. Robot moves along the line to the target point A to D in any order. Then hit the ball from the stand within 1 minute. If the robot can complete the mission and the time is not yet over, the robot can continuously do the missions until timeout.

Article 8 Preparation before competition

- 8.1 The participant places the balls on all stands.
- 8.2 Place the robot on the intersection at the center of the playing field.
- 8.3 No testing before playing.

Article 9 Starting the game

- 9.1 The playing will begin when the participant turns switches on to run the robot operation. After that the robot must move automatically and independently without any control from any device.
- 9.2 While the robot doing that mission, do not bump the stand. If bumped, the score of the ball at that point is not counted and must end the game immediately.

Article 10 How to play

- 10.1 When the game starts, the robot moves out from the starting point.
- 10.2 When leaving the starting point, the robot must move along the line to any target point.
- 10.3 When the robot moves to the target point, it hit the ball to fall from the stand. Team gets one point.
- 10.4 If the ball accidentally falls off, the referee will bring it back to the stand.

- 10.5 When the robot complete hit the balls from all stands, must move back to the center of the playing field to confirm that mission is complete.
- 10.6 From rule 10.5, the robot can continue to do mission in next round immediately to collect more score until timeout.
- 10.7 When the ball fallout from the stand, the participant must remove it out from the playing field by themselves and can be placed again when the robot completes the mission to run continually collecting scores in a new round.
- 10.8 The referee records the score after timeout or when the participant asks to stop the playing or hitting the stand is occurred.

Article 11 Retry the competition

- 11.1 Each team can retry at any time in case:
 - 11.1.1 The robot stops moving but still over the line.
 - 11.1.2 The robot moves along the line wrong direction.
 - 11.1.3 The robot still moves along the line but no progress of movement.
- 11.2 When the retry is occurred, the participant picks up the robot and place back at the starting point. The stand and the ball are still in the same position before the retry request.
- 11.3 Previously achieved scores will not be canceled. Scores will not be score for hitting the ball previously done in that round.

Example 1

The robot can hit the ball 3 times in one movement. Then request for retry, team will get 3 points. When making a new running, scores are not added until the ball is correctly hit for the 4th time. If the robot continues to complete the mission, it will continue to get more scores until the end of the competition or until the robot moves outside the line.

- 11.4 Participant can repair and improve the robot within the playing field upon request to retry. But do not download or re-upload the program and it is strictly forbidden to change the control board. In case of violation, the referee will order to terminate the competition.

Article 12 The playing time

- 12.1 The playing time is 1 minute.
- 12.2 No testing time before starting.

Article 13 Scoring

- 13.1 When robot moves to the target point and can hit the ball fall from the stand, get 1 point each.
- 13.2 After the robot complete all missions and moves back to the middle of the playing field to start a new round of missions.
- 13.3 The robot can continue doing the mission after complete hitting the ball 4 points. The referee will count the points continuously when completing the mission.
- 13.4 If the robot can do the mission completely without any retry, team will get the bonus point as 5 points.

Example 2

The robot moves out from starting point and hit 8 balls without retrying. Team will get the score as follow :

1. *Score from hitting the balls. Get one point per ball. Total is 8 points.*
2. *Score from bonus point. It is 5 points.*

Total score is $8 + 5 = 13$ points.

Example 3

The robot moves out from starting point and hit 11 balls with retry 1 time. Team will get the score as follow :

1. *Score from hitting the ball 11 balls, it is 11 points.*
2. *No bonus point due to retry 1 time.*

Total score is $11 + 0 = 11$ scores.

Article 14 The end of playing

- 14.1 Time up 1 minute.
- 14.2 Participant request to stop the playing.
- 14.3 The robot moves to bump the stand.
- 14.4 The robot moves out of the line.

Article 15 Starting of the robot

The starting of the robot is possible with a single press of a switch or button on the robot. After that, the robot will work automatically.

Article 16 The lack of progress

- 16.1 If the following cases happens for more than 10 seconds shall be deemed to lack of progressed in this game.
 - 16.1.1 The robot does not move
 - 16.1.2 The robot is spinning all the time.
- 16.2 If the robot lack of progressed, the referee will order to force to retry.

Section 5 The game format

Article 17

- 17.1 In the first round is a playing to collect points. Each team completes its own mission to earn scores.
- 17.2 Every team has chance to complete the mission at least 2 times Choose the best scores to be placed in the rank.
- 17.3 The top 4 teams with the highest scores will ahead to the final round.
- 17.4 In case of equal scores, the referee will consider the based on other competition round. The team who has better score in other competition round get better rankings.
- 17.5 The finals round will be played on the same rules as the first round.

Article 18 Ranking

- 18.1 The top 4 teams with the highest scores will ahead to the finals.
- 18.2 Team 5th to 8th won **the 3rd runner-up award**.
- 18.3 Team 3th and 4th in the finals won **the 2nd runner-up award**.
- 18.4 The 2nd place scoring team in the finals won **the 1st runner-up award**.
- 18.5 The highest score team in the finals won **the Champion of competition**.
- 18.6 If the teams playing in the finals have equal score, will have to play again. The team with more scores will be the winner.
- 18.7 From rule 18.6, if still got equal score, will have to play again. The team that can hit the ball in all 4 positions first is as the winner.

Section 6 Fouls

Article 19

The participants who act insulting, abusing an opponent, whether verbally or physically, or lets the robot make noises, express messages or act in a disrespectful manner will be disqualified.

Article 20

If the participants do any of the following, will be deemed to be fouls as well:

- 20.1 Do any act that interferes with the opponent's robot.
- 20.2 Enter the opponent's field, throw, or bring any piece or equipment into the opponent's field.
- 20.3 Take any action that causes the competition to be stopped without justifiable reason.
- 20.4 Acts of any kind that are disrespectful to the competition.
- 20.5 Take any action that contradicts or does not accept the decision of the referee without sufficient justifiable reason.

Section 7 Punishment

Article 21

Those any participants do the action following the Article 19 and 20 will be ordered to terminate the playing and count the score as received.

Article 22

If the mentor does the action following the Article 19 and 20, all the teams that mentor supervised will be disqualified.

Article 23 Conflict of judgment

During the competition, the referee's decision is final.

Section 8 Damage and accidents during the playing

Article 24 Request to stop the competition

Participants can request to stop the playing when their robot has an accident that can't continue to run.

Article 25 Time for repairing

25.1 Participants can repair their robots at any time of the competition but the time remain continues.

25.2 Must be repaired at the playing field only.

Section 9 Identification of the robot

Article 26

The identification of the names or numbers of robots participating in the competition must be always made clearly and easily visible.

