WORLD ROBO TOURNAMENT

Challenge Manual 2019

1 Eligibility

- Participants must be between 8 to 16 years old as of 31 December 2019. (open to Primary and Secondary students)
- The minimum number of participants per team is 2.
- The maximum number of participants per team is 3.

2 Game Objective (s)

- The aim is to build and program a robot to compete in a soccer game.
- Team members will control their individual robots using any form of wireless communication, connected via Bluetooth or Wi-Fi.
- Participants are to bring their own controllers; organisers **will not** be providing any equipment.

3 Playfield Design

- The playfield is 2366mm x 1147mm. Height of the surrounding wall is 70mm (tolerance of 5mm). Refer to the figures below for more information.

Figure 1: Playfield map design

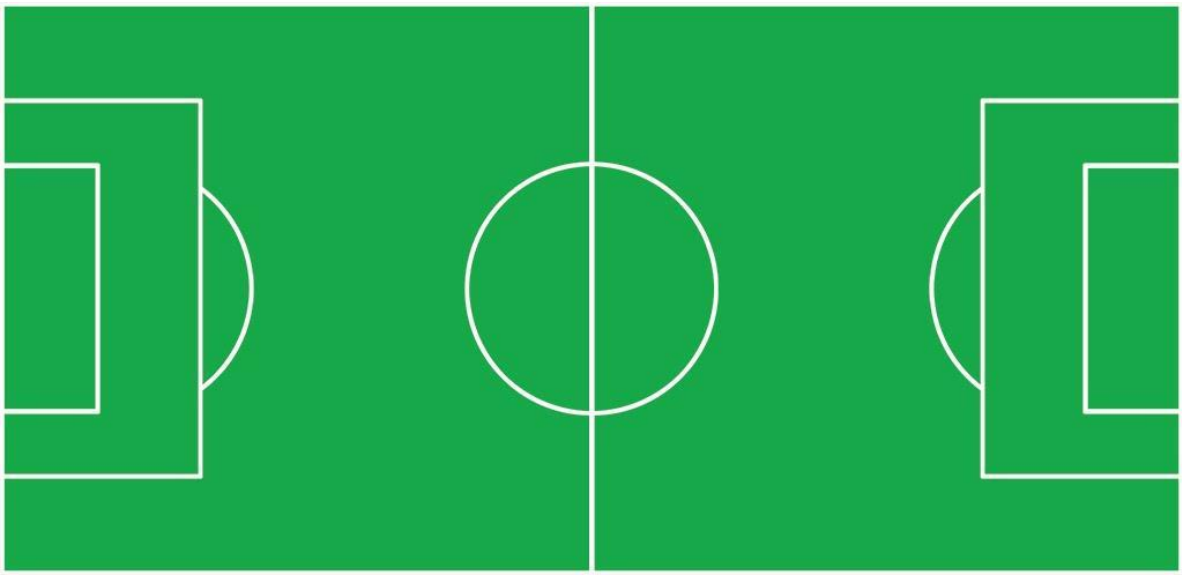


Figure 2: Goal Post LDD (include attachment of the LDD)

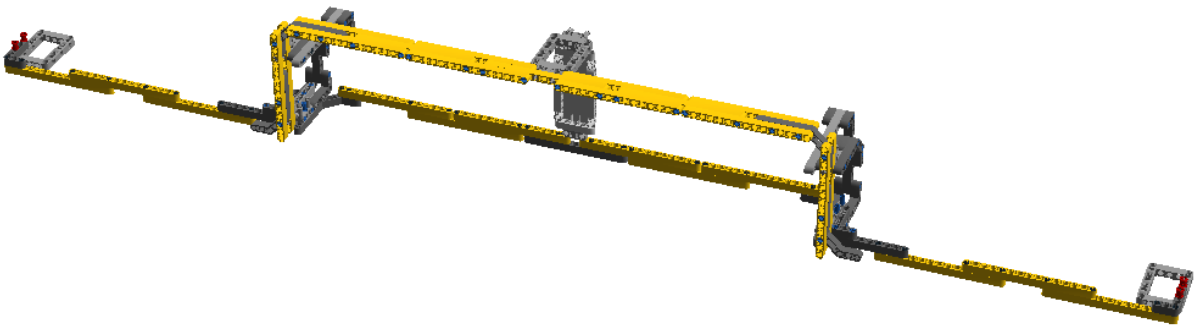
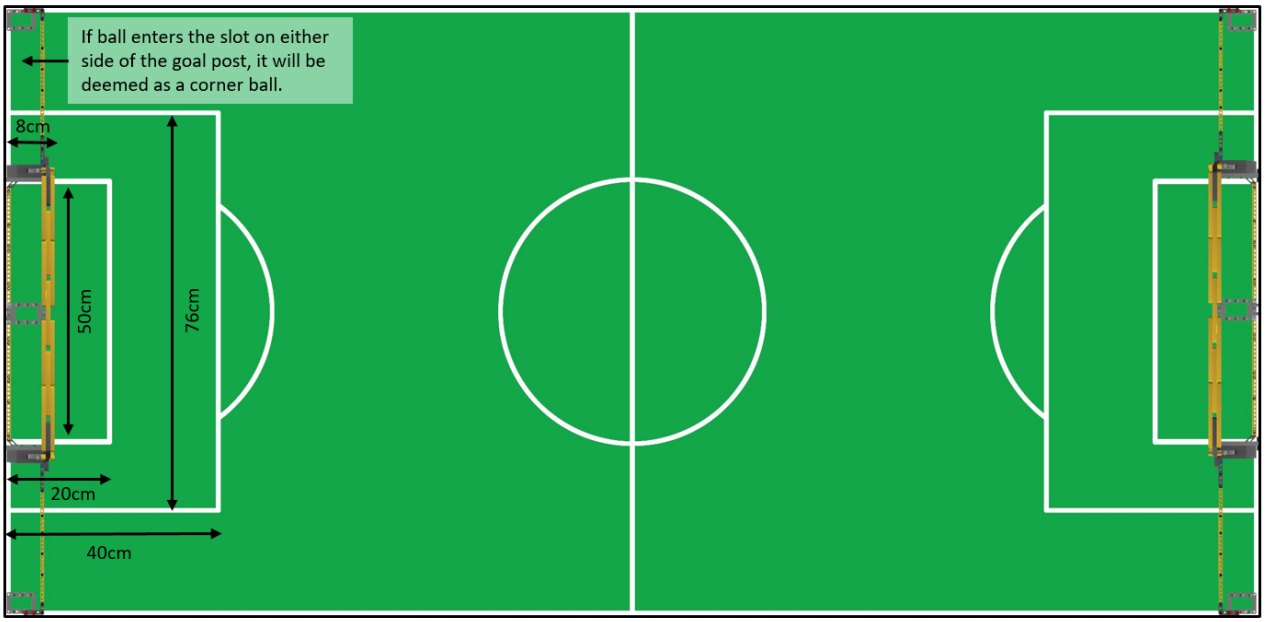


Figure 3: Goal Post on map



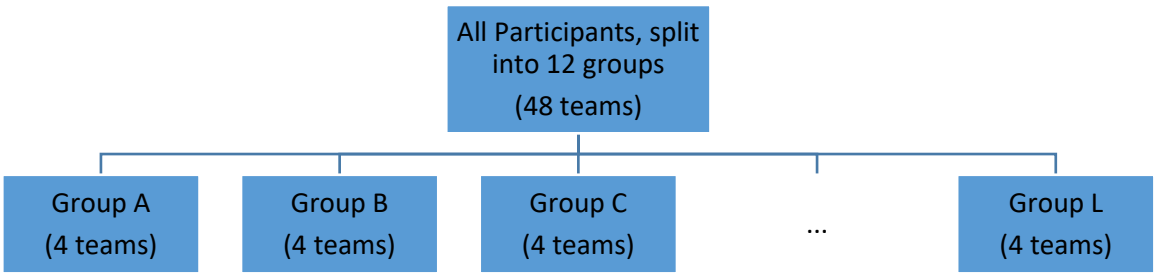
4 Game Play

- Teams are encouraged to plan out a strategic attack and defence plan.
- Each team consists of 2 robots along with 2 controllers.
- Teams are assigned a goalpost each. When the signal is given to begin the match, teams will attempt to guide the ball into the other team's goal post.

4.1 Battle to the Finals

- The initial competition consists of group stages (round-robin) and division matches (elimination).

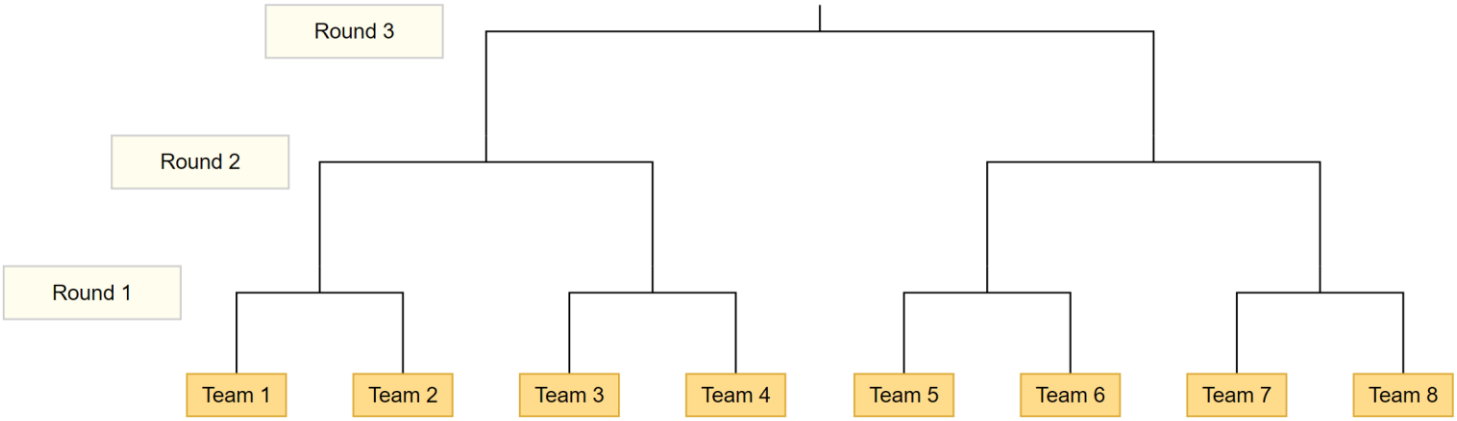
Group Stages



- Each team will compete against all other teams in their respective groups (3 matches in total).
- Points will be awarded to teams according to their performance in the matches. The points system will be as follows:
    - Win – 3 points
    - Draw – 1 point
    - Lose – 0 points

- Teams will be placed randomly into Division I or II for the second phase of the competition depending on their performance in the Group Stages

Division Matches



- There are 2 divisions in this round – Division 1 and Division 2. Teams will participate in either one depending on their performance in the Group Stages.
- Teams will participate in elimination matches until the final 3 teams per division have been decided.
- In the case of a draw between teams after time-up, the Golden Ball rule applies.
- The final 3 teams will proceed to compete in the grand finals.

Grand Finals

- The final 3 teams from division 1 will compete in a set of round-robin matches (3 matches) to determine the following award winners:
    - Division 1 – Champion
    - Division 1 – 1st Runner-Up
    - Division 1 – 2nd Runner-Up

- The final 3 teams from division 2 will compete in a set of round-robin matches (3 matches) to determine the following award winners:
    - Division 2 – Champion
    - Division 2 – 1st Runner-Up
    - Division 2 – 2nd Runner-Up

- In the case of a draw between teams after the match time is up, the Golden Ball rule applies.

- The points system for the Finals will be as follows:
    - Win – 3 points
    - Lose – 0 points

Golden Ball Rule

- In the case of a draw between teams after time-up, the next team who scores a goal within the next 2 minutes will be considered the winner of that match.
- In the case where a winner have not been decided after the Golden Ball rule have been applied, the referee will end the match and determine the final location of the ball. The team with the ball closer to the opposing team's goal post wins the match.

5 General Rules

- The match will last for 5 minutes.
- The size of the robot has to be within **250mm X 250mm X 250mm** when fully extended.
- Students are permitted to bring in pre-built robots into the competition venue.
- A maximum of **3 motors** per robot is allowed.
- All authorised LEGO® parts can be used.
    - Teams are allowed to use only **ONE** controller (NXT or EV3) per robot
    - No modified/custom printed parts allowed
    - Teams are allowed to use the LEGO® MINDSTORMS® Commander app to control their robot.
    - Teams will be asked to remove any non LEGO® parts or else they will not be able to participate in the run.

- Teams are fully responsible for the maintenance of their robots. No special consideration will be given in the event of any technical difficulties encountered.
- The ball used for this competition will be the red/blue NXT Lego ball (52mm in diameter).
- The referees will have the final say in any dispute.

- The referees have the right to disqualify any team that shows defiance or unacceptable behaviour, including inappropriate words and/or behaviour towards other teams, audience members, referees, or organizing committee members.
- Strictly NO sharing of robots with other teams. Teams found to be sharing robots will be disqualified.
- Teams are allowed to do modifications their robot when they are not running.
- However, during lunch time, teams have to place their robot at the quarantine table for judging awards.
- Team coordinators will inform teams about their robot inspection before every run at least 10 minutes before their designated timing.
- At least 1 person should be at the waiting area at all times. Failure to do so may result in being disqualified.
- At no point in the game should the challenger touch the robot in the playfield. Doing so will be considered a foul or an attempt to cheat. This includes a damaged robot.
- After the match, please check the scoring sheet to ensure that your score is correct.
- After checking, counter sign next to your score to certify that your score is correct.
- If there is any discrepancy with the score, highlight to the referee of your match to rectify the problem.
- In the event of any discrepancy with the score, the Event Head holds the rights to annul the scores and/ or may request for a rematch.

5.1 Pre-match Meeting

- Teams will be randomly assigned half of the field by the referee.
- All matches will begin with a kick-off.

5.2 Kick-off

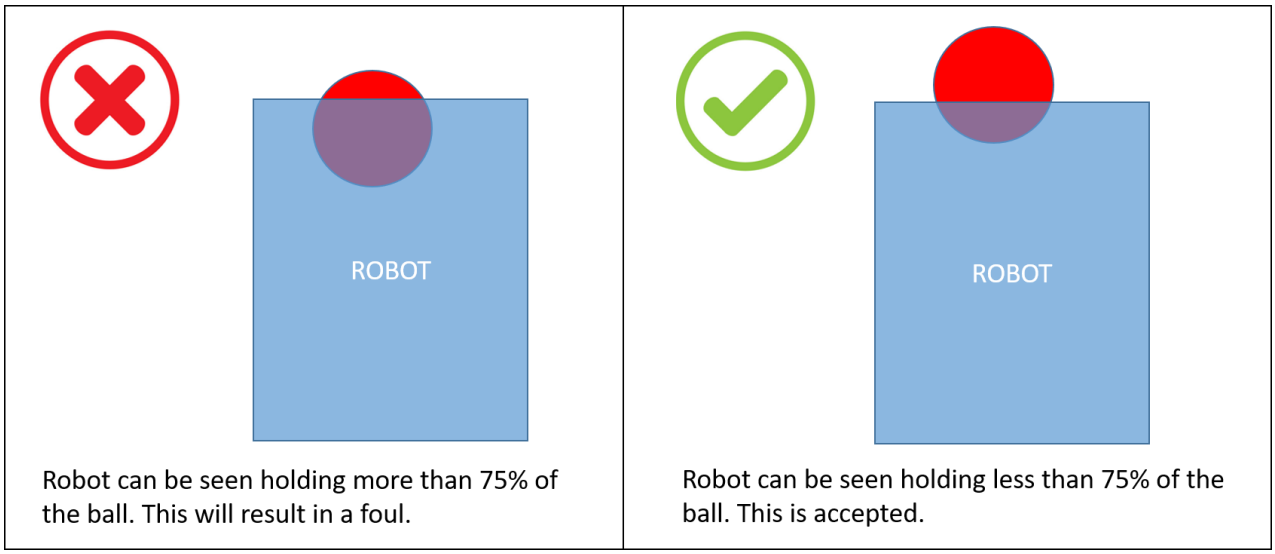
- Game will begin when the ball is placed in the middle of the playfield (There will no kick-off for the first ball). All robots must be located on their own side of the field. All robots must be halted. The ball is positioned by a referee in the centre of the field.
- Robots cannot be placed nor remain behind the goal line or in the outer area. Robots cannot be re-positioned once they have been placed.

- The team not kicking off will now place their robots on the defensive end of the field. All robots on the team not kicking off must be outside the centre circle.

5.3 Ball Movement

- The robot cannot cover more than 3/4 of the ball. Opposing teams' robots must be able to access the ball.
- Examples of holding include:
    - Trapping more than 3/4 of the ball (refer to Figure 4)
    - Preventing others from accessing the ball
    - Ball stops rolling on the surface of the playfield (eg. Being lifted off the playfield)
    - The only exception to holding is constructing a dribbler that does not violate any of the rules above.
    - If the ball enters into the slots on any side of the goal post, it will be deemed as a "cornered" situation. The referee will pause the game and reset the ball in the middle of the playfield. The game will then resume when the referee give the sign to carry on
- At no point in the game should the participant physically touch the ball without the referee's permission. Doing so will result in a Foul.

Figure 4: Trapping



Robot can be seen holding more than 75% of the ball. This will result in a foul.

Robot can be seen holding less than 75% of the ball. This is accepted.

5.4 Scoring

- A goal is scored when the ball strikes/touches the back wall of the goal post. Goals scored by any robot will be considered a goal. For example, if the defending robot scores the goal into their own goal post, a score will be given to the attacking team.
- After a point is scored by the attacking team, the match will be reset with the defending team taking the kick-off at the centre of the playfield.
- The robot must not be in contact with the ball to be considered as scoring a goal.

5.5 Goalie

- At any point in time, only one defending robot is allowed to be within the penalty area.
- If the other defending robot goes into the penalty area, it will be immediately repositioned at the centre line by the referee.

5.6 Tackle

- Tackle is defined as a robot in contact with another robot, with the purpose of retrieving the ball.
- A robot can only tackle if the opposing robot is holding a ball.
- If a robot tackles another robot without a ball it is considered a foul.

5.7 Foul

- 1st foul: verbal warning is given
- 2nd foul: yellow card; the fouled robot is penalized with a 10 seconds time-out (removed from the field).
- Subsequent fouls: red card; the fouled robot is penalized with a 30 seconds time-out (removed from the field).
- After the time-out is over, the referee will place the penalized robot back into the field in a neutral spot as to reduce the disruption of the ongoing events of the other robots.

5.7 Lack of Progress

- Typical lack of progress situations are when the ball is stuck between robots, when there is no change in ball and robot's positions, or when the ball is beyond detection or reach capability of all robots on the field.
- After a visible and loud count of three, the referee will call "lack of progress" and will move the ball to the nearest unoccupied neutral spot.
- If this does not solve the lack of progress, the referee can move the ball to different neutral spots.

5.8 Damaged Robots

- Damaged parts will be removed immediately from the playfield by the referee. Damaged robots CAN be fixed on the spot while the match is ongoing.
- **There will NOT be any pause or timeout during the match in the case of a damaged robot.**
- After fixing the robot, the challenger is to inform the judge that the robot have been fixed.
- The referee will inspect and place the robot back into the field in a neutral spot as to reduce the disruption of the ongoing events of the other robots.
- If the robot is damaged and immobilised, it will be removed out of the field at the referee's discretion.
- At no point in the game the participant is allowed to place his robot back at his own discretion.
- Doing so may result in disqualification.

5.9 Interruption of Game

- The game will not be stopped, unless the referee calls for a time-out. In the event of a time-out, all robots must be stopped and remain on the field untouched.
- The referee may decide whether the game will be continued/resumed from the situation in which the game was stopped, or by a kick-off.

6 Awards

Best Robot Performance	Champion

Division 1	1st Runner Up
	2nd Runner Up
Best Robot Performance Division 2	Champion
	1st Runner Up
	2nd Runner Up
Best Robot Construction	Champion
	1st Runner Up
	2nd Runner Up
Most Valuable Player Division 1	
Most Valuable Player Division 2	
Judges' Award	

Last Updated: 12 Sept 2019