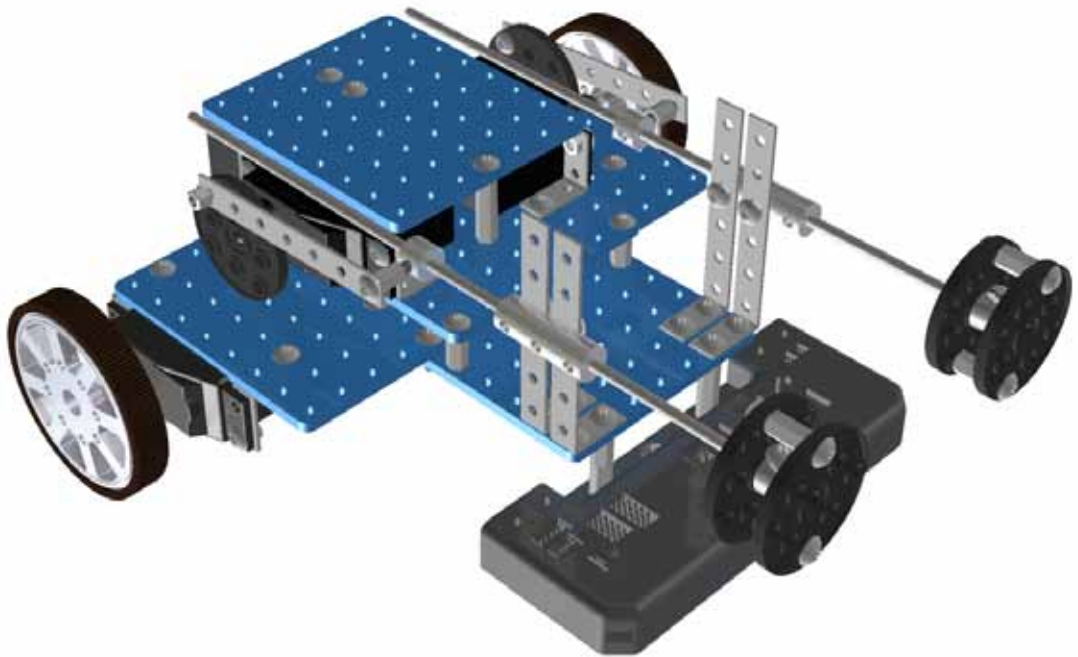


7. Pushing Robot



Introduction and working principle

- Home Robots by means of a sensor that detects the edge



Based on the same principle with the edge detecting robot, Pushing Robot is a robot that basically keeps advancing, and, when meeting a black line or edge while advancing, changes direction and advances.

The infrared sensor attached to the lower side of controller is able to identify whether there is floor or not, via the reflected infrared ray. When meeting an edge or black line, Pushing Robot recognizes it to be floor-less as no infrared ray has been detected. Based upon this principle, the Pushing Robot is enabled to stick around the table or stay inside of the black line border.



Figure 1. Robot Cleaner
“ROKIT Cleaner”

It is home robot that usually requires such edge-detecting ability for use. Robot cleaner is able to recognize neighboring environments using sensors, it autonomously moves and thus does not require external controller. It is able to detect obstacles in the neighborhood, using infrared sensors, ultrasonic waves or tactile sensor.

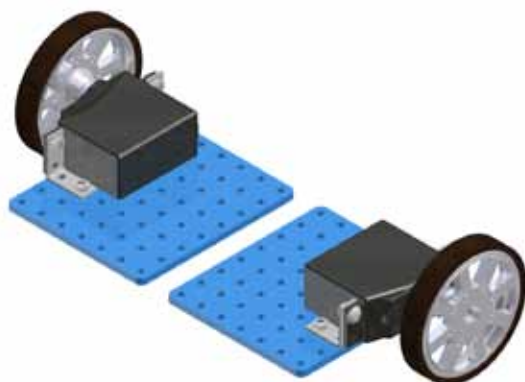
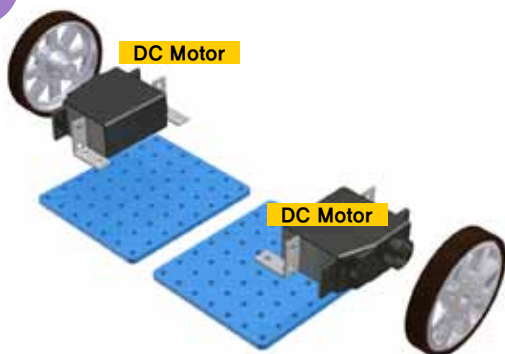
- Infrared sensor and ultrasonic sensor can be used to observe objects from a long distance. Whereas infrared sensor is economically available, ultrasonic sensor can accurately measure the distance to an object. Ultrasonic distance measurement can be applied to any medium, such as glass, through which light can travel.

- Contact sensor is enabled to determine an object by contacting the object. It can be counted as less advanced one, but it can give accurate performances as it is not affected by external factors, and it remains malfunction-free. Such contact sensor is less used in a single manner. Rather, it is used complementarily with the ultrasonic sensor or infrared sensor to cover blind spots where the latter long distance detection sensors miss.

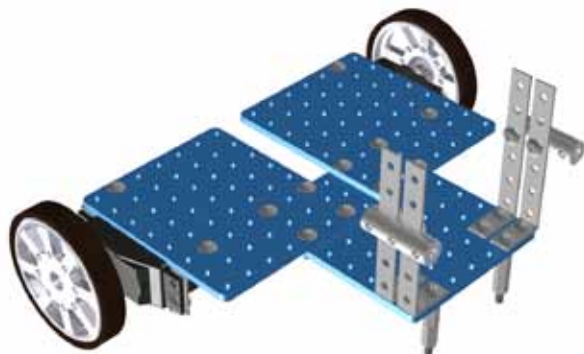
Much the same as in Pushing Robot, it is enabled to detect edge by using infrared sensor.

It is one of key functions of cleaning robot. Robot Cleaner with no edge detection function may come to fall from stairs or a certain height, or even go out of the house.

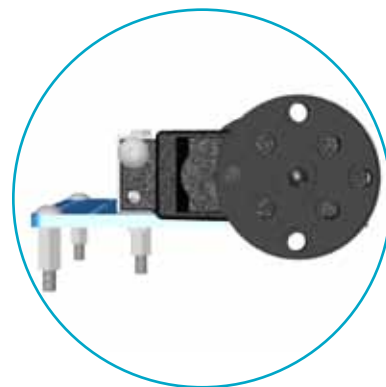
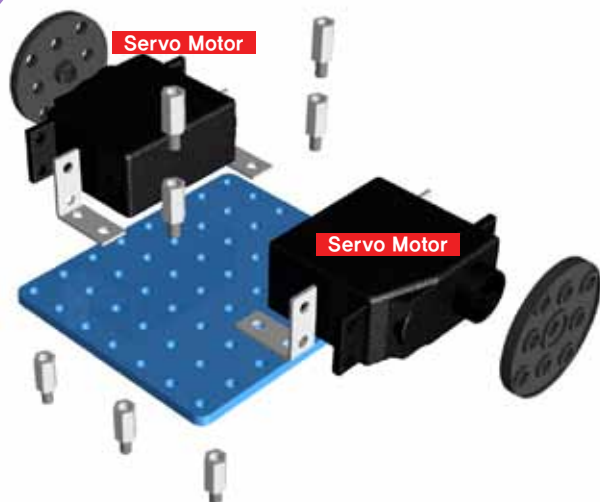
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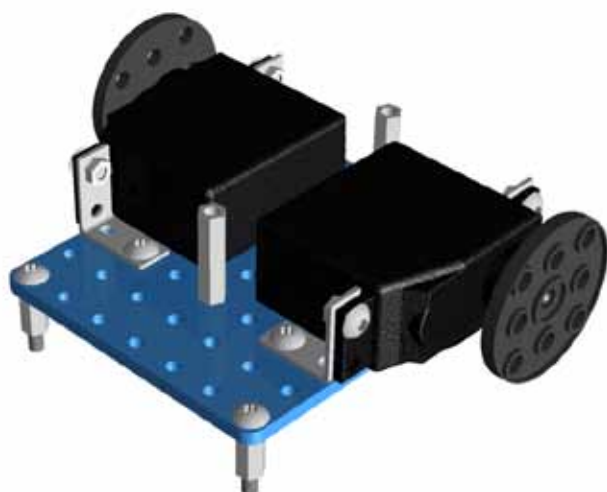
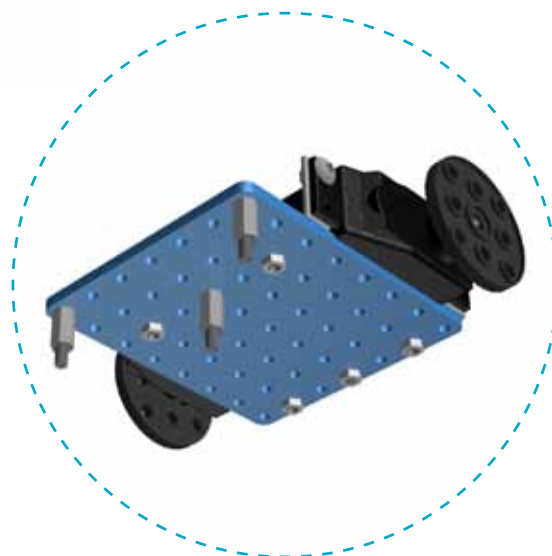
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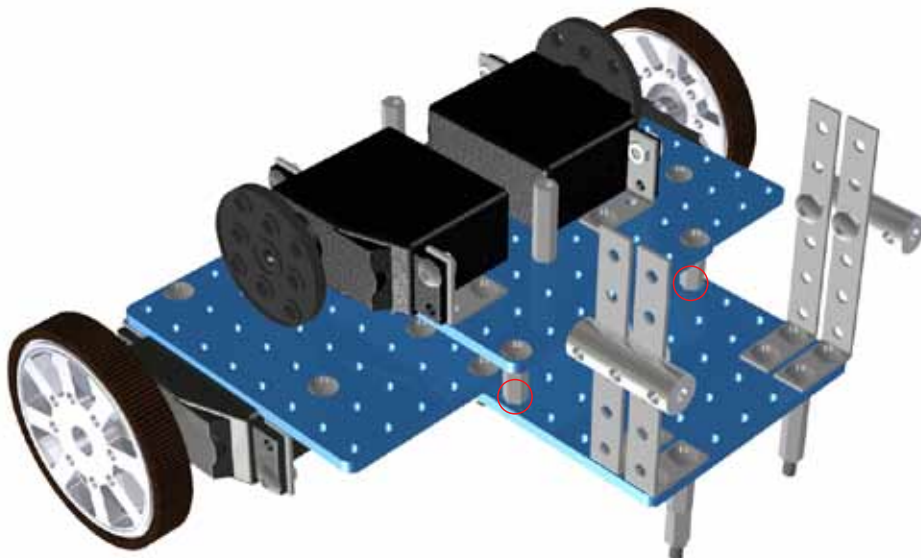
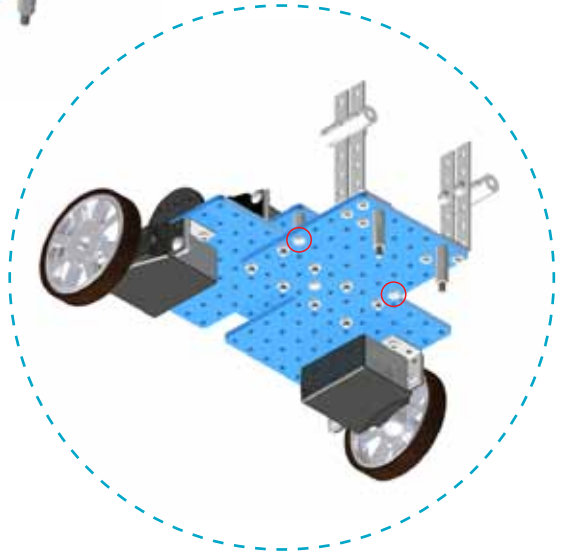
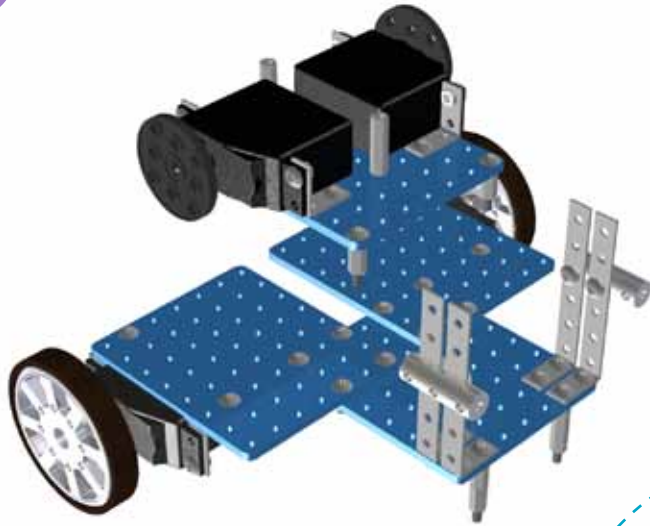


3



 X 2
  X 7
 10mm





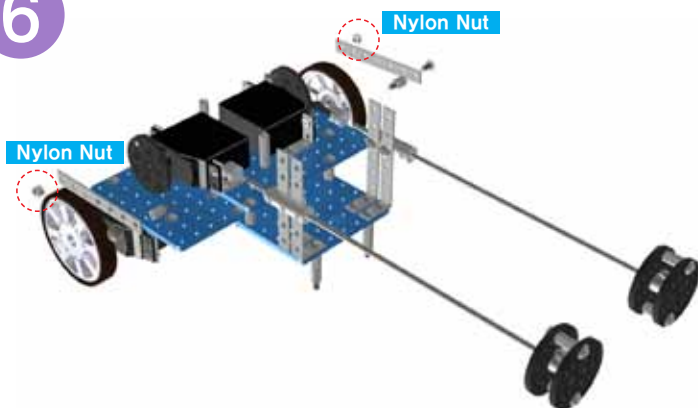
5



10mm X 4



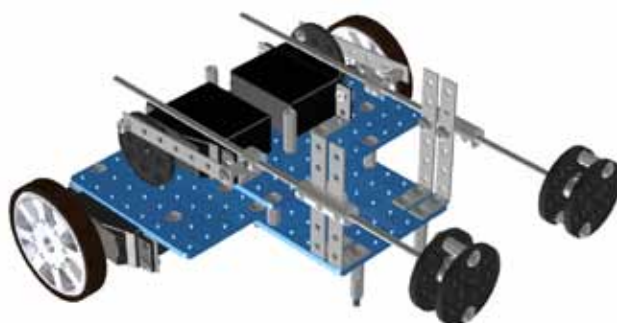
6

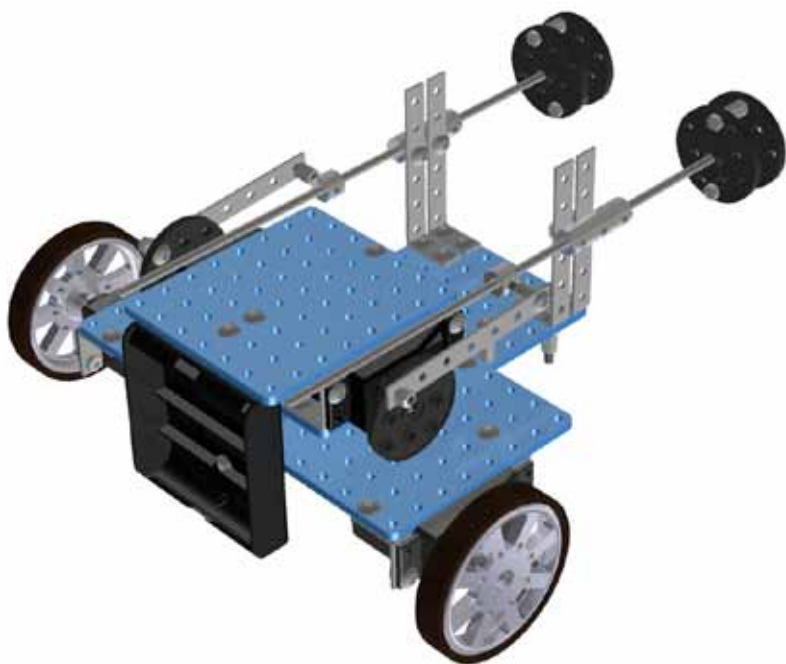
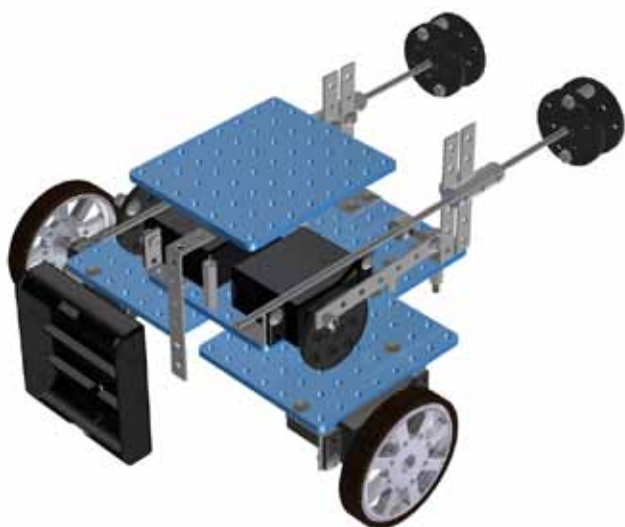


Nylon Nut

Nylon Nut

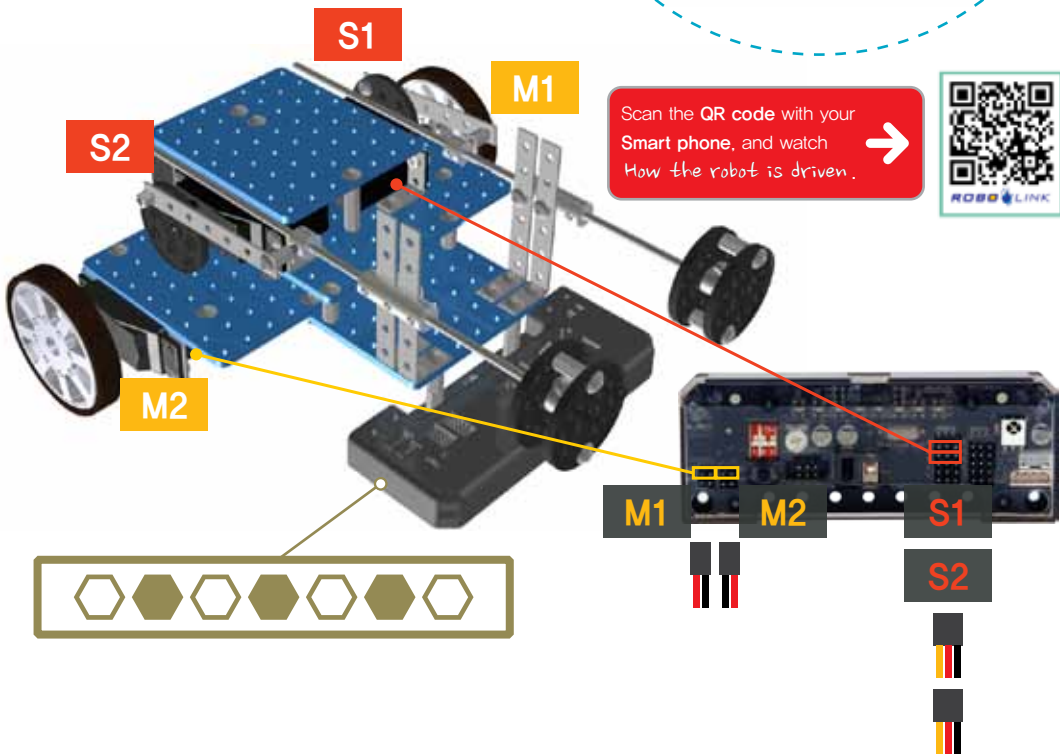
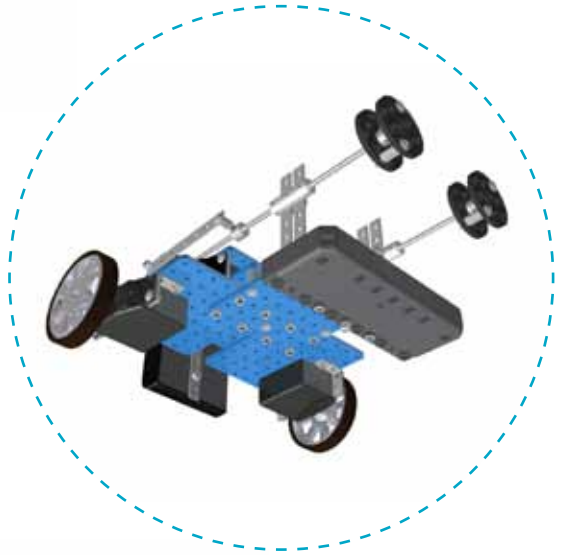
X 2 X 2
7mm X 2
X 2



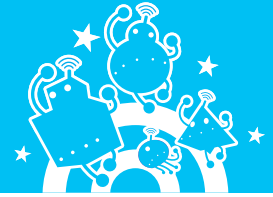




Nylon Nut



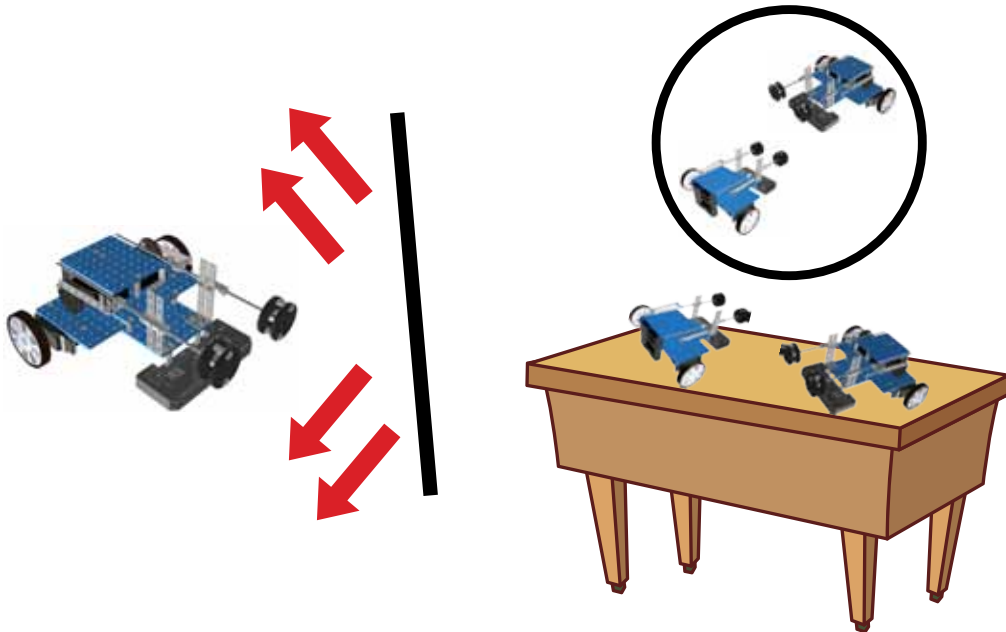
Acting Module



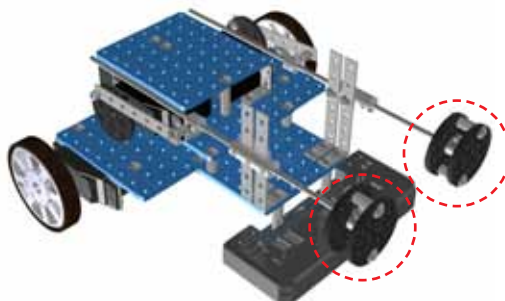
For driving Pushing Robot, select and press program mode 7.



In Smart Rokit Step 2, program is due to be running on with number 2 toggle of DIP switch turned upward. In other words, Smart Rokit Step 2 basically uses channel number 3. Refer to '2. Channel set-up for remote control' in page number 15 that gives you more in details for further reference.



Pushing Robot is an avoider that is enabled to avoid black line on the floor. Not only black line, it can also detect and avoid floorless void, from the height of a desk or table.



Pushing Robot is enabled to push obstacles or opponents out of arena, by motorizing two servo motors, one for front direction and the other for rear direction.

Play the Game!

– Pushing Robot Game



Requirements : a number of plastic or wooden columns with about 10cm of height

1. This game is most playful when 3 or 4 Pushing Robots join together to compete. 1 to 2 minutes of play time is suitable.
2. Find a flat top desk. Or, find a square floor and stick adhesive black tapes around all sides of the square floor. If flat top of the desk is colored in black or close to black, it may not work regularly, since the infrared sensor installed at the lower side of controller recognizes black color as identical to an edge. Stand the plastic or wooden columns at any points randomly inside of the playground.
3. With a starting signal, begin running the Pushing Robot Game program. Where to start Pushing Robot in the playground does not matter, but starting direction of the Pushing Robot is advantageous when towards the center of the desk or playground.
4. Who has not been pushed out of the desk or playground and who has survived to the last minute wins the game. When a number of Pushing Robots has survived to the last minute, then who has thrown down more columns wins the game.
5. In order to prevent Pushing Robot from being completely deformed when falling down from top of the desk, it has better lower the height of it as much as can. Otherwise, it should be played on the floor.

