



Introduction to Robotics: Student Lab

The Robot. The robot you will be building today uses direct drive, and is small and mobile.



Mindstorm book: Pages 4 – 7.	
Pieces:	1 2x4 Flat
1 RCX	2 1x8 Flat
2 Motors	4 1x2 Flat
2 Wheels	2 2x2 Block
2 Wires	1 6 post Beam
3 2x6 Flat	1 Foot

The nature of these programs is to confirm your knowledge of how motors control forward and backward motion and turning. You will also learn about “conditional” programming, meaning that a condition will trigger the performance of portions of the program.

Programs

1. Program your robot to move forward for two seconds and then stop.
2. Program your robot to rotate in place for two seconds and then stop. Experiment with the **two methods of turning**. Which method turns the robot farther? (*One motor on, one motor off vs both motors on in opposite directions*)

Save!

3. Program your robot to move forward for two seconds, spin 180 degrees (or so), return to its starting point, and then stop.
4. Program your robot to move forward in the shape of a square. In other words, it moves forward, turns 90 degrees (or so), moves forward, turns, and so forth until it has returned to its original position, and then stops.

Save!

5. Program your robot to move in a square like in program 4, **but** the robot will only turn 90 degrees when the touch sensor is pressed. Use a long wire to attach the touch sensor to the RCX. Remember to use an input port.

Saving:

Please save Program 3 as “Wk2_3_YourTeamNames.vi”

For YourTeamNames use your first names only.

If you get far enough, please save Program 5 as “Wk2_5_YourTeamNames.vi”

For YourTeamNames use your first names only.

FOR TEACHER USE:

Software discussed:

1. Motors
 - a. Forward
 - b. Backward
2. Stop Output
3. Wait for:
 - a. Timers
 - b. Event – touch sensor

Parts discussed:

1. RCX
 - a. Output and input ports
 - b. Display and buttons (covered in week 1)
2. Sensors
 - a. Touch sensor

Concepts discussed:

1. Moving
 - a. Forward, backward
 - b. Turning
2. Conditionals
 - a. Turn duration
 - b. Touch sensor triggers turning.

Broken or Bad Wires

Get rid of with Cmd+B.

Go over common wiring errors.