

It's the Robot's Turn

Mindstorms Challenge 2: Turning Your Robot

Team Members: _____ Period: _____

AFTER DEMONSTRATING ALL MISSIONS, TURN THIS PACKET IN

Turning

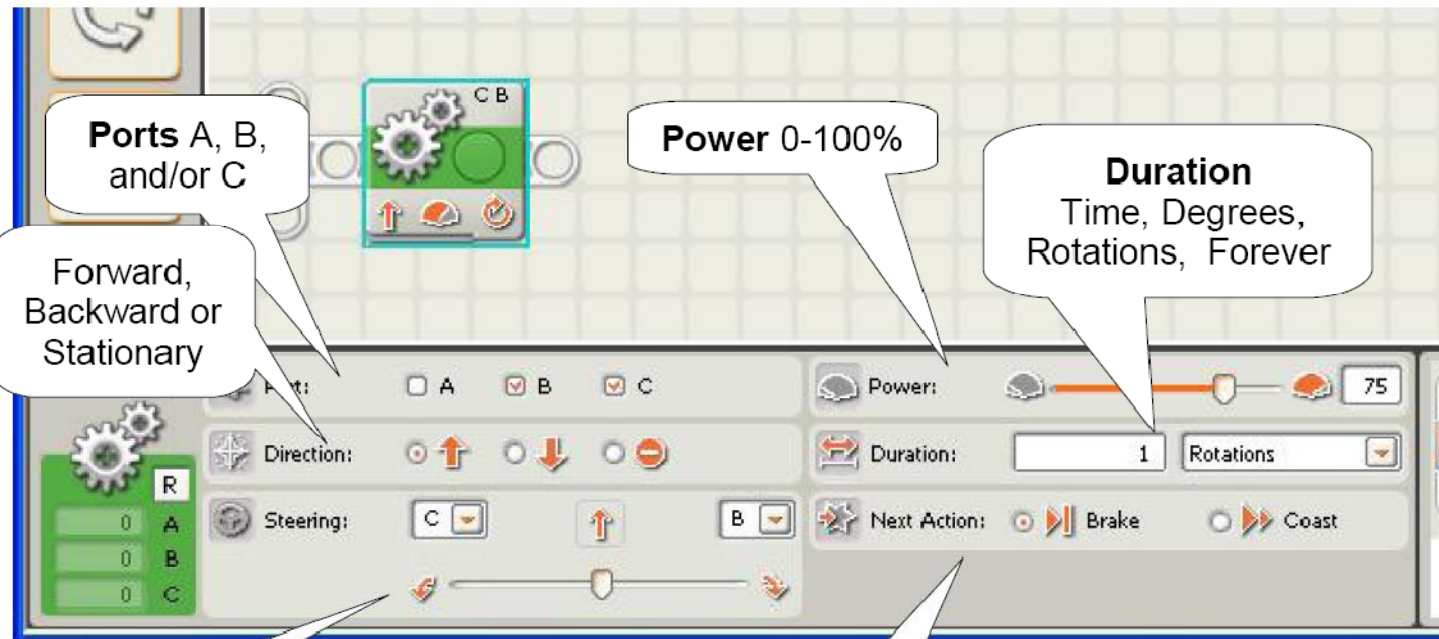
- In the last challenge, we explored how to move exact distances. That's fine, but what if you need to do something beside go straight? In this challenge, we'll work on turning.
- We know how to move. Any ideas how to turn?

Turning

Two ways to turn:

1. Run a single engine for a set period of time
2. Change the steering on a two engine move block.

Move Block Review



Making a Move Block a Turn

The image shows a screenshot of the LEGO Mindstorms software interface for a Move block. The interface is annotated with several callouts explaining its settings:

- Ports A, B, and/or C:** A callout pointing to the port selection area, which includes checkboxes for ports A, B, and C.
- Forward, Backward or Stationary:** A callout pointing to the Direction controls, which include buttons for Forward, Backward, and Stationary.
- Steering Spin, Pivot, Arc, Straight:** A callout pointing to the Steering controls, which include buttons for Spin, Pivot, Arc, and Straight.
- Power 0-100%:** A callout pointing to the Power slider, which is set to 75%.
- Duration Time, Degrees, Rotations, Forever:** A callout pointing to the Duration field, which is set to 1 Rotations.
- Next Action: Brake or Coast:** A callout pointing to the Next Action controls, which include buttons for Brake and Coast.
- Either turn off one of these engines:** A blue callout with an arrow pointing to the checkboxes for ports A, B, and C.
- or change the steering here:** A blue callout with an arrow pointing to the Steering controls.

Challenge 2 Mission 1 – Right Angle Turn

- Design, construct, and program a robot to travel in a straight line going forward 3 rotations. Then make it execute an exact 90 degree turn making the robot turn a right angle. Finally, have it move 3 more rotations. Try both turn methods.

The angle of the turn is important. It needs to be as close to 90 degrees as possible. Use the lines in the tile to help you see how close you are to 90 degrees.

WHEN COMPLETE, SHOW YOUR TEACHER

Teacher's Initials: _____

Challenge 2 Mission 2 – The Boxer

- Design, construct, and program a robot to that moves in a box shape. Using a loop, change the program your developed in ‘Challenge 2 Mission 1 – Right Angle Turn’ to make your robot take 4 right turns to make a box shape. First, do the turn **ONLY** 4 times so your robot ends up where it started. Then change your program to do this forever.

WHEN COMPLETE, SHOW YOUR TEACHER

Teacher's Initials: _____

Challenge 2 Bonus Mission

THIS IS AN OPTIONAL MISSION TO BE WORKED ON IF YOU COMPLETE THE OTHER MISSIONS.

- Repeat 'Challenge 2 Mission 2 – The Boxer'. Change your angle and program so that your robot consistently ends up in the same spot. Consider running on a difference surface.