

Goal: *Familiarity with the NXT brick and with basic movement in NXT-G.*

Materials Needed: *Assembled Brookbot, sensors optional*

Part 1: The NXT Brick

The Lego NXT has 4 sensor ports, 3 motor ports, 4 buttons, and a screen. Ask your students which of these are input and which are output. If they don't know, provide examples of I/O with a computer: mouse and keyboard are input while monitor and speakers are output.

Make sure to show them the battery, the charger, the battery life indicator, and how to power the robot on and off.

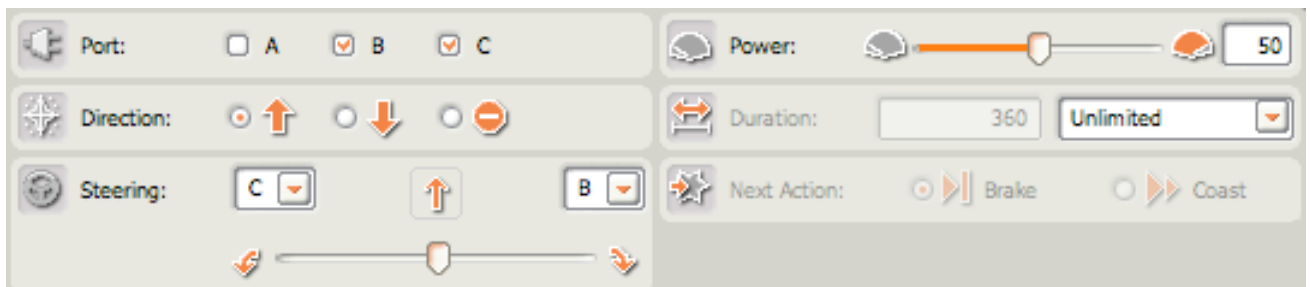
Part 2: NXT-G

A. *Moving Forward*

To go forward, simply grab a move block from the common palette:

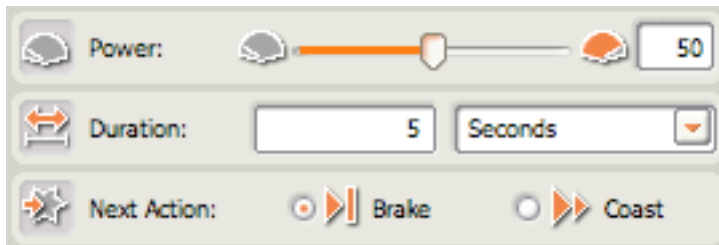


Make sure to point out the block options at the bottom of the screen. Specifically, mention the ability to reverse directions, stop the motors, change which motors are being controlled, power level, and braking versus coasting. For the purposes of this first exercise, set duration to unlimited.



B. *Time*

Presumably, you want your robot to stop rather than going on forever. To control how long your robot moves, adjust the time in the block options, or use a time block.



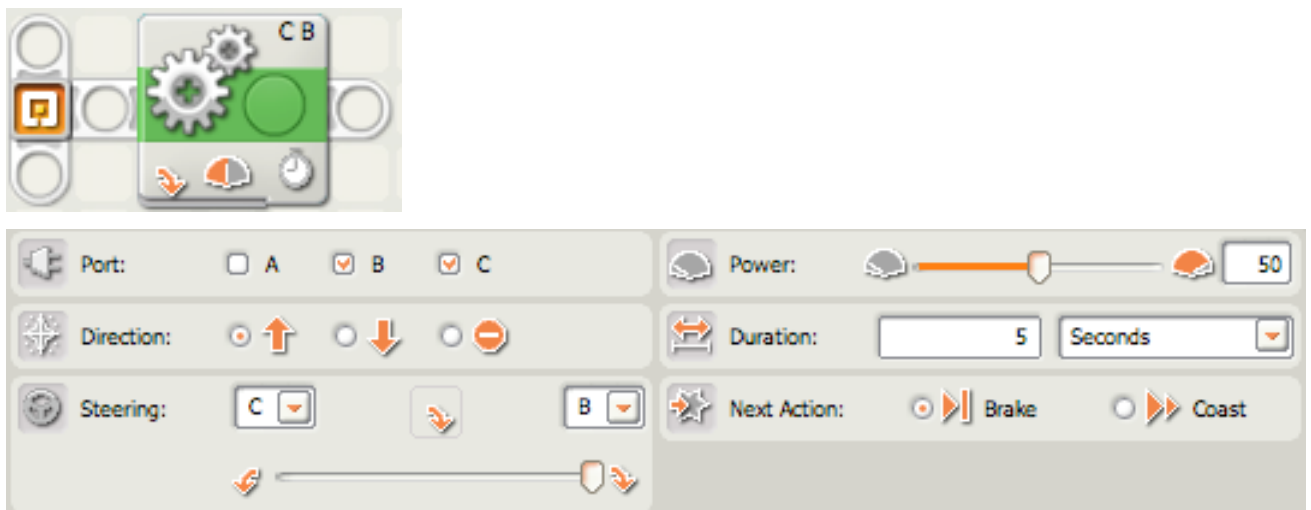
Or:



C. *Turning*

The robot is not built for the wheels to tilt like on a car. How, then, can we get the robot to turn? Get your students to figure out the solution to this question: power only one wheel, or spin the wheels in opposite directions. Explain the difference between these two approaches.

To code a turn in NXT-G, use the move block, or use two motor blocks and a time block:



Or:



Part 3: Dead-Reckoning Challenge!

Program your robot to navigate a very simple course. Explain the concept of dead reckoning: navigation based on precise foreknowledge of the environment. The faster the better, but try not to hit the edges of the course!