Teacher Notes: Right Face!

Introduction to Mobile Robotics > Right Face!

Description of the Unit

In order to do useful work in a human environment, the Personal Assistant robot needs to be able to navigate around common obstacles, such as walls, furniture and even people. This lesson covers the basic programming required to make the robot turn, and then has students investigate what is necessary to get the robot to turn to face a specific direction.

Unit summary: students will…

- Model the robot's behavior using human actions (turning and going forward)
- Program the Personal Assistant robot to make two types of turns
- Investigate the relationship between programmatic motor settings and overall robot behavior

Prerequisites:

- Have Taskbot or Robot Educator model (REM) robots built for each group
- Full Speed Ahead Activity
- Present to class the Right Face! slideshow from Teacher's Curriculum CD and have class discussion (optional)

Approximate classroom time: 3-4 class periods (45-minute periods)

Note to the teacher

This Activity can be performed with either the Taskbot model or the Robot Educator model (REM) robot. Note, however, that Taskbot moves forward with the NXT screen facing *backward*, whereas REM moves forward with the view screen facing *forward*.

This Activity, "Right Face!" is linked to the Investigation, "Measured Turns," in which lies the bulk of the measurement, calculation and communication work. *It is highly recommended that both activities be used together*, as they both teach critical skills which students will need in future units.

- The "Right Face!" Activity, which guides students step-by-step through the process of building a program to make the robot turn one way, and then modifying that program to make it turn in different ways.
- The "Measured Turns" Investigation, which involves students in an investigation of the relationship between robot geometry, motor degrees and the amount the robot turned.

Students frequently encounter trouble running the correct program once they have saved it under a different name. It may help to have them verify the name of the program that they are running on the NXT (just above the word "Run" on the NXT view screen) with the name of the program on the tab in the upper left-hand corner of the programming environment (just under the toolbar).

Students will be able to:

1. Program a robot to turn using the LEGO MINDSTORMS programming environment
2. Connect the robot to the computer and download programs to it
3. Navigate to and run programs on the NXT
4. Make the robot do both left and right turns, as well as one wheel ("swing") and in-place ("point") turns