Day 3: Teaching Your Robot to See

(3 of 6 of the Robotics Club Module)

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# Summary

Students will learn how learn how engineers program cars to use sensors to know how to react to what they sense. They will do the four challenges again, but this time they will use the sensors so that their robocar can know when to stop and turn without knowing the distances ahead of time.

# Engineering Connection

A self-driving car needs to use sensors to allow it to react to unexpected things in its environment. It needs to know if it is about to hit a wall or if a dog runs out in front of it. Programming a sensor involves telling it how to react to various sensor readings that it receives. For both us and them, programming requires a lot of trial-and-error and troubleshooting.

# Grade Level

4-6

# Duration

60 minutes

# Cost Per Group

$0

# Materials List

Each group needs:

* Lego NXT robot - $279
  + including the ultrasonic sensor for the NXT robot
* A computer with the Lego NXT software installed

To Be Shared By All:

* The courses shown in the slides and handout, which can be made from blocks, boxes, paper and tape, or some other set of materials. This time, some time of “walls” will be needed to put on the edge of courses and for the garage walls for the ultra-sonic sensor to sense.
* A projector or something similar for displaying the presentation slides.

# Learning Objectives

After this activity, students should be able to:

* Work with a technology design
* Apply their understanding about science and technology
* Demonstrate abilities of a technological design
* Use troubleshooting as a problem-solving method used to identify the cause of a malfunction in a technological system.
* Use information provided in manuals, protocols, or by experienced people to see and understand how things work.

# Procedure

Before the activity:

* attach the ultrasonic sensor to the top of each robot and confirm that it works by testing the drive\_into\_garage\_example.rbt program. It is important that the sensor is firmly attached to the robot and does not wobble, otherwise, it will not work. You are attaching it instead of the students because the sensor will not work if it is wobbly.
* Place the two example programs, drive\_into\_garage\_example.rbt and back\_into\_garage\_example.rbt in a place where the students can download them and experiment with them to see how they work.

For the activity:

* The rest procedure of the lesson, including assessments, is embedded in the presentation slides. See the slides and slide notes for more.