

Maze Competition - NXT

Suggested Time

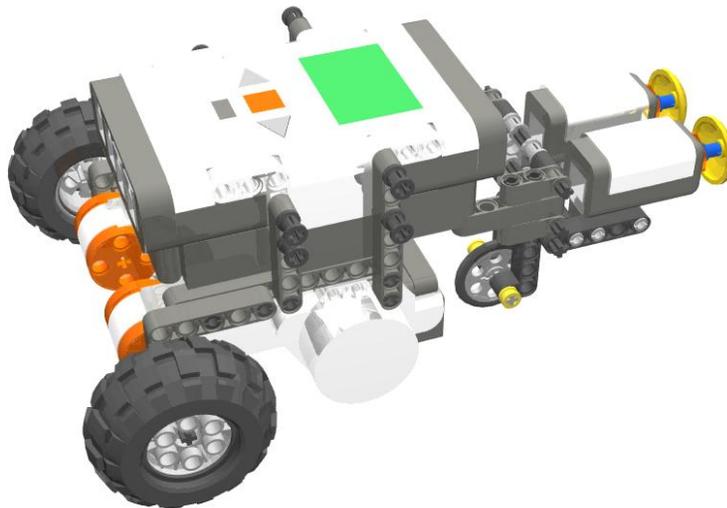
60 minutes

Age

8 - 13

Challenge

In this activity, design and construct an NXT car and program it to allow for navigation capabilities using a touch sensor remote control.

***Topics***

Touch Sensors

Subjects

Engineering & Technology

Programming Themes

Motor Forward / Backward, Wait for Touch

Related Math & Science Concepts

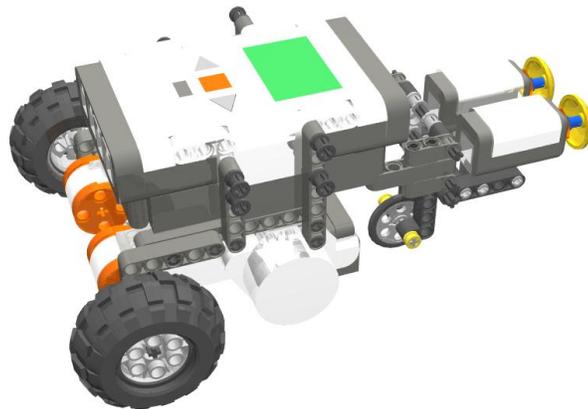
- Acceleration
- Velocity
- Gears
- Wheels and Axles

Materials

- NXT Car
 - Assortment of LEGO Pieces
 - Tape or LEGO Walls for Maze
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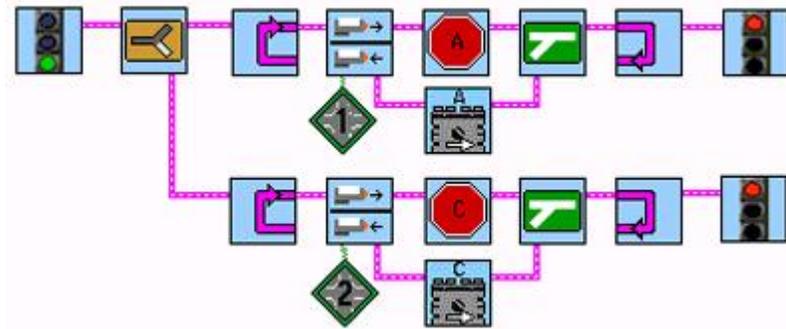
**Building
Instructions**

1. Build a car which is capable of turning and is controlled by 2 touch sensors.



**Programming
Instructions**

1. Choose whether to use ROBOLAB or the LEGO NXT Software to program (follow step 2 for ROBOLAB; follow step 3 for LEGO NXT Software.)
2. Using ROBLAB INVENTOR 3, program the car to be controlled using 2 touch sensors.
- 3.



- Using the LEGO NXT Software, program the car to be controlled by 2 touch sensors using a sensors using a series of loops and forks.



In Action

Collect three data points (time, distance) and plot. Using this plot determine how much time is required to run the car in order to come within an inch of an arbitrary distance. The arbitrary distance can be marked using a small LEGO person.

Classroom Management

- Use tape to make a "starting line" on the floor.
- Cars should be programmed to drive for 2 seconds and then stop. Students should place the cars at the starting line and run the program.
- Students should measure the distance the car traveled.
- Repeat this programming and measuring action at least two times, programming for 4 and 6 seconds.
- For added excitement, the teacher can place LEGO people on the finish line and students can try to drive as close to the line as possible without knocking over any of the people.
- Students should plot the data on graph paper. Time is on the X-axis and distance is on the Y-axis.
- After students have plotted data, the teacher will pick a distance and ask students to use their graphs to predict how long their cars should drive in order to stop as close to the line as possible without touching it or driving over it.
- Discuss the activity with the students, talking about graphing, linear equations, and making predictions.
- Have groups of students test their cars at one time to see which group can come closest to the line.
- Include a few minutes at the end of the activity to talk for discussion. Topics can include discussions about why different cars drive different distances in the same amount of time.