

Parking Space

It is a long-standing tradition in some neighborhoods of Boston to dig the snow out of a parking space after a snowstorm and then save the space with traffic cones, lawn chairs, etc.

Such a parking space has been saved for you. All you have to do is park in it.

You will have time to practice driving on the three-meter-long street. You may use this time to try driving various distances and times. What you try is up to you; the only rule is that you must make a table and graph of your data.

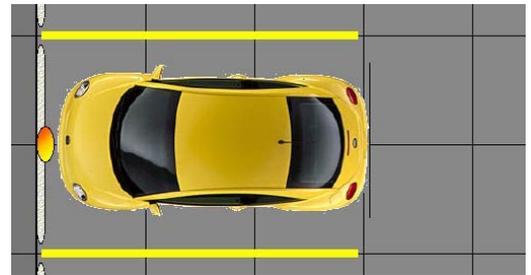
At the end of the practice time, you will be told exactly where your parking space is. After you are told, you may program your car, but you may not run it.

After all of the cars are programmed, we will run them one by one and see which ones are able to park entirely within the space.

Good luck!

Procedure:

1. Build a NXT car from the elements in your kit.
2. Write a NXT program to run your robot car forward for 1 second.
3. Download and run your program.
4. Measure your distance from the starting line of the road. Record your results on a line graph.
5. Repeat your program changing the time values each time to 2 seconds, 3 seconds, 4 seconds, and 5 seconds.
6. Record your results on your line graph after each test run.
7. According to the information on your graph, make a prediction of how long you need to program your robot to travel to your parking space. You also need to account for turning into your space. Less than one inch of your car must be hanging out of the space. You will only have one shot at parking in your spot!
8. Write your program and download into your robot. Wait for teacher instructions on when to run the program.



Teacher Notes

Objectives:

1. To collect data to solve a particular problem.
2. To use data to make predictions, then test them.
3. To interpolate from a line graph plotting time vs. distance.

Materials:

NXT kit
Computer
Tape for marking lines
Meter stick
Stopwatch

Time: Approximately 45 minutes

Notes:

1. Before starting this activity, create a three-meter-long course for the cars with strips of tape for the start and finish.
2. Tape off sections to the side of the course for the parking spaces. The activity can be made easier or harder by adjusting the size of the parking space. A 30 centimeter long space provides a challenge but will allow most students to be successful.
3. Depending upon the students, you may want to give them some guidance in collecting data, measuring and encourage them to graph their results.
4. The assessment for this activity can be accomplished in different ways.
 - Require any student who is not successful to repeat the challenge, with different parking space locations, until they pass it.
 - Note each group's results on the initial test and then give prizes – a small prize to any group which comes within one inch of being completely within the space without going over; a slightly larger prize to the group that parks completely within the spot.

Resources:

- [Physics by Design](#) by Barbara Bratzel