

Velocity Gedanken Lab

The *Never-Go* toy company has a problem. Customers are complaining that the *Roaring Roadster*® radio controlled toy car that *Never-Go* makes is not able to move fast enough when the speed is set at maximum. The packaging claims that it can move at over 35km/h. The company wants you to figure out what the speed of the car is when it is set at maximum.

You take one of the cars and set the speed to maximum. You then measure how far it is able to travel (displacement) during several different time intervals. The data that you collect follows.

Gedanken Lab?

The idea of a “Gedanken” (a German word) is most often associated with Einstein, but physicists have been doing it for centuries. Simply put, it is an experiment you run in your mind and on paper based on known physics theories. This is sometimes necessary since it may not be possible or convenient (for various reasons) to actually perform the experiment.

Trial	Time (s)	Displacement (m)
1	5.00	49.5
2	10.0	101
3	15.0	147
4	20.0	199
5	25.0	245

Based on this information, you need to write up a full lab report to determine if the car actually does run at the speed guaranteed on the package. You must keep the following in mind while writing up your lab report.

1. You must write a **complete** lab report following all the guidelines.
2. Your “Procedure” must describe how you **would have** conducted your experiment with the car to get the data above.
3. I've already done part of the work for you... the table above is all you need for the “Observations” section.
4. In the “Analysis” section you will create a graph based on the data. Think carefully about how to correctly place the variables on the x and y axis. You will then **use your graph** to get the average velocity of the car.
5. When you are completing the “Sources of Error” section, make sure to compare your experimental value to the company's accepted value for the speed of the car.
6. Your “Conclusion” must contain a statement as to whether or not the company is in trouble with their customers.