

Name _____
Regents Physics
Period _____

Date _____
Lab Activity #4R (50 pts)
Mrs. Nadworny

Partners:
(If working alone, please indicate)

Due Date: _____

Going for a Ride

NO Lab Write-Up Required!

Background

Whenever you drive around in a car, the speedometer shows you the car's instantaneous speed. Additionally, once the trip is over, you can calculate the average speed of the car for the entire trip. This takes into account the speeding up and slowing down of the car and gives you an average over time.

Purpose

To determine the average speed of a car during a trip and then compare it graphically to its instantaneous speed.

Materials: _____ (2 pts)
(Include devices used in the car)

Procedure (2 pts)

Complete the procedure below by indicating time interval and total time of travel. Groups may work collaboratively to collect data, but each individual must complete their own analysis and post-lab questions.

1. Reset the trip odometer to zero.
2. Start the stopwatch/timer when you begin to drive.
3. Every _____ minute(s) record the instantaneous speed from the speedometer.
 - Common sense says that you should not attempt to take data if you are the driver!
4. Repeat for a total of _____ minutes, until 15 speeds have been recorded.
5. Record the trip odometer when the last speed data point is recorded. This is your total distance traveled.
6. Convert your total travel time into hours. Show your work on the next page.
7. Using your total distance and total time, calculate the average speed of the vehicle.

Data Collection Complete the data table below. (10 pts)

Time (min)														
Speed (mi/hr)														

Total Distance Traveled - _____ (2 pts)

Data Processing

1. Convert your total travel time into hours using dimensional analysis. (4 pts)
2. Calculate your average speed (in miles per hour) for the entire trip using the GUESS method. [Hint: The average speed is NOT the average of the different speeds.] (5 pts)
3. Create a graph of your instantaneous speed versus time. (15 pts)
 - Label all axes and title your graph using the format learned in class.
 - When plotting this graph, **CONNECT** data points.
 - Add to this graph a line representing your average speed (in miles/hour) for the entire trip. Label the average speed line.
 - Attach the graph to this lab worksheet.

Post Lab Questions: Answer the following questions in full, complete, English sentences below. It's important to choose your words carefully and identify and report only relevant information.

1. How does the average speed of a car during a trip compare graphically to its instantaneous speed? (3 pts)

2. How does the average speed and instantaneous speed depict the same motion differently? (3 pts)

3. Identify one source of error. State what the error was. Explain how it happened. Explain how it affected your data (increase or decrease time or speed). Explain how it affected your results (graph). [Note: Stoplights and signs are part of your data – do not blame 0 mi/hr as an error. Also traffic is generally part of your data; do not blame it unless something significant happened.] (4 pts)
