



3. Indicate the independent and dependent variables and why each is that specific variable.
  
4. a) Describe the relationship between the data points.  
  
b) Write an equation for the curve.  
  
c) What is the slope?  
  
d) What are the units of the slope?  
  
e) What quantity does this represent?
  
5. What does a linear fit on a position vs. time graph represent?
  
6. How is the velocity calculated if only position and time measurements were taken?
  
7. **Hypothesis:** For an object traveling at a constant velocity, such as the buggies in this lab, what does the velocity vs. time graph look like?

### Procedures for v vs. t graph

1. If beginning on day 2, open logger pro and access your saved file or re-enter your data from the buggy lab, otherwise, continue working with the data from day 1. Remember to change the variables to “position” and “time” in the appropriate column.
2. Make a column for the buggies velocity. By following the steps below, the computer will calculate the buggies velocity at each increment.
  - ✧ Go to **data**, choose **new calculated column**.
  - ✧ Enter the name of the new column (**velocity**) and the appropriate units.
  - ✧ On the same window enter an equation you want the program to calculate by doing the following:
    - 1) Click **functions** and select **delta**.
    - 2) Click on **variables** and select “**position.**” Manually put in a / (**divided**).
    - 3) Repeat step 1. Then repeat step 2 – now choose “**time.**”
    - 4) Select **done** when you have correctly defined the equation for velocity.
3. View the velocity vs. time graph that is produced for this data set by following these steps:
  - ✧ **Left click** on the **y-axis label** (for this lab it will be distance).
  - ✧ Select **velocity**.
  - ✧ Adjust the scales on each axis to better see you data points (enter manually or autoscale).

### Analysis for v vs. t graph

1. For an object traveling at a constant velocity, such as the buggy in this lab, what does the velocity vs. time graph look like?
  - a) Draw a sketch of your graph for velocity vs. time with numbers on the y-axis.
  - b) Identify the y- intercept by including a numeric value (go to analyze, linear fit and you can determine the y- intercept by looking for the value of “b.”)
  - c) What does a horizontal straight line on a velocity vs. time graph indicate about the motion of the buggy?

## Conclusions

1. Look at your data column for velocity in logger pro.

a) What is the average velocity? (**Hint:** *How would you find an average...such as a grade on a test?*)

b) Write down your velocity values from each source in this lab. *Do you notice anything?*

...from x vs. t graph: \_\_\_\_\_

...from v vs. t graph: \_\_\_\_\_

...from the average calculated above (1a): \_\_\_\_\_

c) Why is it logical to expect that all of the above values should be related?

2. A \_\_\_\_\_ line on a position vs. time graph and a \_\_\_\_\_ line on a velocity vs. time graph both indicate that an object move's with a \_\_\_\_\_.