Tumblebuggy Lab

1. Devise a method to determine the speed of your Tumblebuggy within a 5 meter distance. Plot at least 5 different points within that 5 meter distance in order to be able to collect good data for your graphs. Write down the procedures for your method. Make sure to list the materials that you used. You may draw diagrams to help explain your procedure.

2. Determine the velocity of the Tumblebuggy within those 5 meters. Use your collected data and show your work by using the GERC format for at least one of the positions.

3. Devise a method to determine the width of the open area of the class using the information from above. You may not use the meter stick to measure the width. Write down the procedures for your method. Make sure that you list the materials that you used. You may draw diagrams to help explain your procedure.

4. Determine the width of the room using the data that you collected using the GERC format.

5. Construct a Position vs. Time graph for your Tumblebuggy as it travels 5 meters. Plot at least 5 different points on your graph and draw a line of best fit through your data. Make sure that you label and give values to the axes as well as title your graph.

6. Determine the slope of the line from your Position vs. Time graph. Show your work.

7. Compare and contrast the slope from your graph to the velocity of the Tumblebuggy that you determined in Part 2 of the lab.

8. Construct a Velocity vs. Time graph for your Tumblebuggy as it travels 5 meters. Plot at least 5 different points on your graph and draw a line of best fit through your data. Make sure that you label and give values to the axes as well as title your graph.

9. Determine the slope of the line from your Velocity vs. Time graph. Show your work.

10. Answer the following questions using complete sentences.
    - What does the slope of your Position vs. Time graph mean.
    - How would the Position vs. Time graph be different if the car had gone faster or slower.
    - Sketch a simple graph to describe the motion of a car that moves faster and slower than your car.
    - What do you think the graph might look like for a car whose battery was dying over the period of time that the data was being collected?
    - What sources of error influenced your results? Were they random or systematic errors?