

Blinky Car Unit Conversions and Percent Error Calculations**Step 1.**

Record the total distance / total time in blinks from the data table:

Centimeters per blink of blinky car = _____ cm/blink

Step 2.

Record the centimeters per second of the car from the computer motion detector program. The program measures in meters per second, you need to convert it to cm per second. There are 100cm per meter.

Centimeters per second of the blinky car = _____ cm/second.

Step 3.

Determine the conversion factor from blinks to seconds. You will need a stopwatch.

Find the number of blinks in 10 seconds.

Show your work here:

$$\frac{\text{Blinks}}{10 \text{ Seconds}} = \frac{\text{Blinks}}{1 \text{ Second}}$$

Step 4.

Convert the Velocity of the car from cm/blink to m/second using the factor-cancel method and the velocity you found in cm per blink. Show your work here:

$$\frac{\text{Blinks}}{1 \text{ Second}} \times \frac{\text{cm}}{\text{Blink}} = \underline{\hspace{2cm}}$$

Step 5.

Finally calculate the percent error of your measurement of the cars motion using the motion detector value as the correctly accepted value (VAC). Show your work below in full. Remember that percent error is found by: $VAC - \text{Value (experimental)}/VAC * 100$ (for percent).

VAC (velocity found by motion detector:	_____	cm/s
Minus the velocity you found in step 4 above:	_____	cm/s

This is the difference		cm/s
This means divide it by	_____	
The value from the motion detector		VAC
Then multiply by 100 to get it in percent		x 100
This tells you how close your were		Percent Uncertainty
Less than 10% is considered good		Is it less than 10%?

Position Versus Time Graph (column 2 vs. column 1)**Analysis and Conclusions**

Type up the answers for the following questions, then use them to write your lab report.

1. Construct a position (X) versus time (t) graph. (time is the IV)
2. What is the slope of the graph? (rise divided by the run)
3. What are the units of slope?
4. What is the significance of the units of the slope? (What does the slope measure?)
5. What is the equation of the graph? (remember to insert values into $y=mx+b$ form)
6. What does it mean to have a delta Δ value?

Centimeters per blink vs. Blinks graph. (column 5 versus column 1)

Now that you know how to convert cm/blink to cm/s, use your conversion scale and fill in the last column of the data table. Once that is complete, construct a cm/s versus time graph. Do not forget to include the slope of the line on the graph.

Answer the following questions on loose leaf.

1. Construct a graph of time (t) versus velocity (v).
2. What is the slope of this line?
3. What are the units of slope?
4. What is the significance of the slope of this line?
5. Draw a line from the last data point to the x axis. You now have a rectangle. If you find the area of this rectangle, the area will equal a number that you have used in this experiment. What does this number equal?
6. What is the meaning of a slope of zero?
7. What does it mean to travel with uniform motion?