**Title:**

**Data Collection and Processing:**

**RAW DATA:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Distance from A to B**  **(cm)** | **Time from A to B**  **(secs)** | | | **Time @A**  **(secs)** | | | **Time @ B**  **(secs)** | | |
| Trial 1 | Trial 2 | ***Average*** | Trial 1 | Trial 2 | ***Average*** | Trial 1 | Trial 2 | ***Average*** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

**Calculated Data:**

(tA)

(tB)

Vf= 5cm/ tB

a= (Vf- Vi)/ tAB

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Distance from A to B**  **(cm)** | **Position at B**  **(cm)** | (tAB)  **Avg. Time A to B**  **(sec)** | **Avg. Time @ A**  **(sec)** | **Avg. Time @ B**  **(sec)** | Vi= 5cm/ tA  **Initial Speed**  **(cm/sec)** | **Final Speed**  **(cm/sec)** | **Acceleration**  **(cm/sec2)** |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

**GRAPH**

* Make a position vs. time graph using logger pro
  + **Plot the Position at B and time from A to B**
* Make a velocity vs. time graph using logger pro
  + **Plot the Final Speed and the time from A to B.**
  + You need include *slope* on your graph.
  + If you are using Graphical Analysis follow these instructions:
    - Click analyze
    - Click linear fit
    - There should be a box and a best fit line

**Conclusion and Evaluation [typed in paragraph form]:**

***In your own words – not as a group.* If yours is similar to other group members then you will not receive credit for this section. Everyone writes differently. Be authentic in your writing!**

Include the following questions in your conclusion section [paragraph form]:

1. **Is the line on the graph straight or curved?  What does this line tell you?**
2. **Does the car accelerate as it rolls down the ramp? Explain your answer.**
3. **Is the acceleration of the car changing as it goes down the ramp? Explain your answer using what you know about the slope of line.**

**Evaluation**

* Provide suggestions on realistic improvements to the lab.
* What would you do to improve the lab?

**The Effect of Distance between Two Points on a Ramp on Velocity**

**Procedure:**

1. You will be working in your lab group to complete this lab. EVERYONE must be recording their data!
2. You will be using 2 photogates to complete this lab. Set the first photogate (“A”) at the 5cm mark on the ramp. YOU WILL NOT MOVE THIS PHOTOGATE AGAIN!!!
3. You will need to determine with your group where you will place photogate B. You will be studying 8 different distances. Record these distances on the data table provided.
4. Once photogates A and B are setup, make sure the timer is on “interval” and send the car down the ramp. Record your Time from A to B, Time @A, and Time @B.
5. Run another trial at this distance.
6. Move photogate B to the next distance you already chose. Repeat steps 4-5.
7. Repeat steps 4-6 until you have data for all 8 distances.
8. Calculate your averages.