Group Members Present:

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General Instructions
Your task in this group test will be to 1) determine the acceleration of a lab cart as it rolls down the inclined ramp set up at your table, and 2) make a prediction for the time it will take the lab cart to travel a specified distance along the same inclined ramp.

Part One: Determine the Acceleration
Use whatever method and/or tools you wish to determine the acceleration of your cart. Make sure you include a copy of the graph you used.

Acceleration of cart: ______

Part Two: Predict the Time
After you determine the acceleration of your cart, you will be asked to predict the time it will take for the cart to travel a specified displacement along the same ramp. (See below) All carts will be started with the back end of the cart at the top of the ramp. You will be given an initial position and a final position between which you must predict the elapsed time. Below show all the work you did to predict the time it would take for the car to pass through the given points. Once you have been given these values you will not be allowed back to your lab station without your teachers presence.

Initial Position = ______ cm from the start

Final position = ______ cm from the start

Work:

Part Three: The Test

Once you have your predicted time call for an official observation and test of your prediction.

\[ \% \text{error} = \left( \frac{\text{theoretical} - \text{actual}}{\text{theoretical}} \right) \times 100\% \]
Grading: 15 points for diagrams, graphs and work (see rubric below)

10 points for accuracy:
- 10 points for 0-1% difference
- 9 points for 2-3% difference
- 8 points for 4-5% difference
- 7 points for 6-7% difference
- 6 points for 8-9% difference
- 5 points for 10-11% difference
- 4 points for 12-13% difference
- 3 points for 14-15% difference
- 2 points for 16-17% difference
- 1 point for 18-19% difference

Rubric for work:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Graphs are correctly labeled</td>
<td>No or missing</td>
<td>Small errors made</td>
<td>correct</td>
<td></td>
</tr>
<tr>
<td>✓ Data collected for graphs is of acceptable quality</td>
<td>Not enough data points or poor quality</td>
<td>Data collected is of questionable quality</td>
<td>High quality with correct range and number of data points</td>
<td>x1.5</td>
</tr>
<tr>
<td>✓ Graph is linearized (if necessary) and a best fit curve has been applied</td>
<td>No &amp;/or missing</td>
<td>Not correctly linearized or incorrect curve equation</td>
<td>Linearized &amp; best fit curve applied</td>
<td></td>
</tr>
<tr>
<td>✓ Correct mathematical model is used based on given data</td>
<td>No or missing</td>
<td>Small mistake made</td>
<td>correct</td>
<td></td>
</tr>
<tr>
<td>✓ Work is logical and easy to follow</td>
<td>No or missing</td>
<td>Hard to follow</td>
<td>Easy to follow</td>
<td>x2</td>
</tr>
<tr>
<td>✓ Solution is determined using correct method</td>
<td>No or missing</td>
<td>Small mistakes made or group got stuck</td>
<td>yes</td>
<td></td>
</tr>
</tbody>
</table>

Total: / 15