Additional project assessment information

**Project Assessment Categories:** 70 total points

<table>
<thead>
<tr>
<th>Category</th>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creativity</td>
<td>6</td>
<td>Overall design or particular feature of design is unique.</td>
</tr>
<tr>
<td>Construction</td>
<td>10</td>
<td>Construction shows evidence of time and effort in the process.</td>
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<tr>
<td>Quality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>7</td>
<td>Carries egg the entire length of the track during test runs.</td>
</tr>
<tr>
<td>Measurements</td>
<td>7</td>
<td>Meets requirements of length, width, and mass.</td>
</tr>
<tr>
<td>Lab report</td>
<td>40</td>
<td>Thorough completion of lab report (see below).</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>70</strong></td>
<td></td>
</tr>
<tr>
<td>Extra Credit</td>
<td>+1</td>
<td>Design keeps the egg from cracking (extra credit of 1 point per un-cracked crash on Competition Day).</td>
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</table>

**Lab Report Criteria**
Submit a report that fully addresses the following criteria:

1. Purpose (2-3 sentences): Provide a brief statement describing the project and how it is relevant to your real-world experiences.

2. Variables (2-4 sentences): Identify & define the quantities you are measuring and the independent, dependent, and controlled variables that will affect your vehicle’s performance.

3. Materials: List materials and quantities used to construct your vehicle.

4. Methods (2 paragraphs): Describe your building process. Summarize the problems you encountered during the building process and how you solved them.

5. Photograph or Diagram (1 page): Include a photograph or large hand-drawn picture of your vehicle. Label key design features (e.g., crumple zones, safety cage).

6. Data: Construct a data table that provides the following (include measurement units):
   a) distance traveled by vehicle
   b) total time of run (measured with stopwatch)
   c) width of vehicle
   d) length of vehicle
   e) mass of vehicle without egg occupant
   f) mass of vehicle with egg occupant
   g) width of photogate flag (if photogate used, see Figure 4)
   h) time for photogate flag to pass through photogate timer at end of run

7. Calculations
   Show all equations and calculations used to obtain the quantities listed below.
   (If a photogate was used, use the final velocity to calculate momentum. Otherwise, use the average velocity but realize this will only provide an estimate of actual momentum.)
- Photogate used: final velocity = width of photogate flag ÷ photogate time

- Photogate NOT used: average velocity = total distance traveled ÷ total time of travel

- Calculate the vehicle’s momentum before impact using this equation:
  momentum = (total mass of vehicle with egg) x (final or average velocity)

8. Performance Assessment (1 paragraph):
   Citing your own measured and calculated data, describe the performance of your vehicle and whether or not it met your expectations.

9. Conclusion (4-5 paragraphs):
   a) Explain how your vehicle’s design protected the egg.
   b) Compare your vehicle’s performance to another vehicle in the class.
      o What were the strengths and weaknesses of each design?
      o Cite data and calculations to support your conclusion.
   c) There is always room for improvement in a design. How would you modify your car to improve its performance?