

## Additional project assessment information

**Project Assessment Categories:** 70 total points

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

### 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  $\div$  photogate time
- Photogate NOT used: average velocity = total distance traveled  $\div$  total time of travel
- Calculate the vehicle's momentum before impact using this equation:  
momentum = (total mass of vehicle with egg)  $\times$  (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.
  - What were the strengths and weaknesses of each design?
  - 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?