Egg Drop Project

Due Dates: container – _____ report – _____

Objective: Create a container able to protect an egg from breaking during a collision with a tile floor resulting from a two story fall.

Criteria:

- The container may be made of any materials, excluding any type of bubble wrap or sponge, and may not be made of any materials which would damage the floor when dropped.
- Nothing that slows the rate of descent is permitted (parachutes, flaps, wings, helium etc).
- No adhesives (ie. tape, glue, caulking, etc.) may be applied directly to the surface of the egg.
- The container must protect a standard large sized fresh egg from breaking. Egg to be loaded in on test day.
- Egg shells or a sacrificial egg may not be included in the container.
- Must be able to open container to see egg after test.

The spirit of the project is to protect the ordinary egg, similar to the way the cage of a car protects the passenger. The idea is not to reinforce the shell, but rather provide a protective 'vehicle' for the trip.

Mark Breakdown:

1. Prelab calculations → 5 marks (K & U)
2. Record of design, chart of trial & final drops → 5 marks (communication)
3. Performance of the 'vehicle' → 5 marks (inquiry)
4. Analysis of design and actual results with regards to principles of energy & momentum → 5 marks (application)

Format of Report

Please pay close attention to the guidelines provided here. Failure to meet these expectations will result in a reduced communication mark.

Overall – This report is to be written in blue or black ink or typed with the exception of diagrams which are to be done in pencil (as noted below) or by computer drawing. There should be no spelling or grammar errors. Please proof-read.

Purpose

1. This is a statement of the reason for performing the lab.
2. It is written in past tense and in paragraph format.

Materials

1. This section is a list of all materials used to construct your container. If you made more than one attempt, outline the materials used in each container you created, in a separate list. Call them 'container 1', 'container 2', etc.

2. Include a neat and labelled cross-sectional diagram of each container you tested, labelling each of the components of your design. All diagrams are drawn and labelled in pencil or drawn/labelled by computer.

Data/Results:

1. Indicate the results of each trial with each design. In your record, include time and date. You can test as often as you wish at home before test day.
2. Be sure to include your test day results. On test day you have one trial only. (not unlike a car crash – you have 1 time to see if your car keeps you safe). Large-size test eggs (raw) will be supplied by Mrs. H.
3. The data should be printed out in a table or chart. Example:

Date	Time	Container	Result	Detailed Observations
Nov. 8, 2009	6:45 pm	#1	Egg broke	The container turned over while falling and landed on one of its corners.

Analysis

1. This section starts with a discussion of your final, test day egg drop design. Use the concepts of energy & momentum/impulse to explain why the design was expected to protect the egg.
2. A) If your design was **unsuccessful**, discuss, using the concepts of energy & momentum/impulse, why the design failed.
   b) If your design was **successful**, discuss, using the concepts of energy & momentum/impulse why an earlier design failed or was abandoned. (*note: this means you need to have more than 1 design!)
3. End with a discussion on how to reasonably improve your design.
   A) If your design was **unsuccessful**, discuss how you could modify it to be successful. Consider the designs of your classmates to help inform you.
   B) If your design was **successful**, discuss how you could make yours more reliable (did it have to fall a certain way?), or perhaps less cumbersome, or perhaps smaller or with less (costly) material etc. Consider the designs of your classmates to help inform you.

Acknowledgements

The final section of your lab includes the names of people, other than your teacher or classmates, who helped you either perform the lab or analyze the data and a brief statement of how they helped. Also included are citations for any research that was conducted. ie. websites, textbooks.

Marking Scheme

Name:

Prelab Math (C3.4)

Use the given data to correctly solve problems and analyze situation.

☐ GRASP used

☐ Proper sig. digs used.

/5
Knowledge & Understanding

Record of Design, Trial/Final Drops (A1.11)

Record of design, trial and final drops are properly recorded & with appropriate detail.

☐ Follows expectations outlined.

/5
Communication

Performance of 'vehicle' (A1.5)

Egg is perfectly fine = 5/5
Egg shell is cracked but intact = 4/5
Egg shell is fully cracked and leaking = 3/5

/5
Inquiry

Deductions will be made if criteria is not followed.

Analysis of design & results (C1.1, C2.1)

1. 2 marks
2. 2 marks
3. 1 mark

/5
Application

☐ Energy & momentum mentioned in # 1 & #2.