NAME: DATE: Period:

Egg Drop Project

This project is designed for you to demonstrate your understanding of momentum and impulse. Eggs are very fragile and when dropped onto a surface will break. The reason for this breakage is the force of the impulse. If you were to increase the length of time the impulse occurs you can lessen the force. This is where you come in.

You will design and build an apparatus to slow the impact o the ground on an egg. These will be dropped from the top of Temple College over finals week in December. I am estimating the height to be 6.3m. Use this in your calculations if you need.

Rules:

- You may not chemically alter your egg.
- You may not include any dangerous or messy fluids.
- The device must be smaller than $1ft^3$ when deployed.
- The device must have a mass less than 2kg.
- If your egg meets its demise on the ground outside of TC, you must be willing to help in the cleanup.
- Your device must not contain glass or shatter prone plastics.
- Your device cannot contain Styrofoam peanuts (packing peanuts).
- The device must be easily loaded/unloaded with the egg. You have a 1 minute time frame/limit

During the activities there may be a pre-drop qualifying round. All devices will be first dropped from the patio at TC. You must pass the qualifying round to move onto the elimination round atop the building.

Project design
Draw your prototype(s): (make several if you wish, but only one can compete)

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Draw your prototype(s):

What is the principal material or reason causing a slower decent of your egg?

Calculate the volume of your device: _____ (remember Geometry?)

Calculate the mass of your device: _____

Calculate the approximate velocity of your device upon impact: _____

Calculate the momentum your device will have upon impact: _____

Is your device compliant with the rules? _____ (It better be)

Post-design questions

1) What car safety features allow for a lower impulse upon a collision?

2) If you were to toss an egg to your friend, what could they do to ensure the egg didn't break at impact?

3) Why do stuntpeople use huge air bags to safely jump from buildings?

4) How could you make a better bike helmet? What is the purpose of a helmet?