

# NAKED EGG!

*A Performance Assessment (honors)*

Name \_\_\_\_\_ Name \_\_\_\_\_ Period \_\_\_\_\_

**Materials:** **Two grocery bags** (plastic) to keep landing area clean, **15 sheets of paper** (notebook or computer), up to one foot of **scotch tape**. (You will need to supply the tape!) Mr. Lanham will provide ONE raw egg per group of two.

Materials Check Off (Lanham's initials) \_\_\_\_\_

**Your mission:** Design a landing platform to allow a naked raw egg to survive a fall. The platform can **only** consist of paper and scotch tape.

| <b>PreLab:</b>   | Points | Value |
|--|--------|-------|
| List five (5) safety features used to cushion objects in crashes:  |        | 5     |
| What is the safest new car (OR SUV, van, truck) today? (make/model) List the website where this information was found. |        | 3     |
| What is a <b>Shockwatch</b> label? (hint: Shockwatch is a brand name)  |        | 2     |
| In terms of <i>acceleration, force, time and impulse</i> , describe why crumple zones makes cars safer.                |        | 5     |

|   |  |          |
|---|--|----------|
| Which variable must be reduced to increase survivability of your egg?                                 |  | 5        |
| Which variable must be increased?   |  |          |
| <b>Hypothesis:</b><br>What <u>specifically</u> about your plan/design leads you to this hypothesis?   |  | 10       |
| <b>Mr Lanham's signature for above points:</b><br><b>DO NOT LOSE THIS PAPER!!!!!!!!!!!!!!!!!!!!!!</b> |  | SUBTOTAL |

**Data:** (video is an acceptable *backup* for observations)

Mass of egg: \_\_\_\_\_ grams      conversion: \_\_\_\_\_ kilograms

**EACH DROP**

| Measured:<br>Height (cm) | Conversion:<br>Height (m) | Observations |
|--------------------------|---------------------------|--------------|
|                          |                           |              |
|                          |                           |              |
|                          |                           |              |
|                          |                           |              |
|                          |                           |              |
|                          |                           |              |
|                          |                           |              |
|                          |                           |              |

**Data** \_\_\_\_\_ / 20 points

**Calculations:** Using the height in meters for your last successful drop, calculate the following: (5 points each)

Time:  $d = \frac{1}{2} g t^2$

Speed:  $v = g t$

Momentum:  $p = m v$

**PostLab Questions:** (5 points each)

What was the change in momentum? ( $\Delta p = p_f - p_o$ )

If the time impact happened to be 0.2s, what was the force on the egg?  $I = F t$

If the time impact happened to be 0.2s, what was the acceleration of the egg?  $a = F / m$

**Conclusion:** 20 points - Include: (1) Your results, (2) what specifically about your design led to these results, (3) what design changes you would make if you did it again, (4) a new hypothesis for design changes and (5) a rationale for the new hypothesis.

Participation, on task, preparation, planning, safety, following directions, materials, good sportsmanship... \_\_\_\_\_ / 5 points

**BONUS:** The highest successful drop in your class!