

# Eggsploring Momentum *Manipulating Momentum & Impulse*

**INTRODUCTION:** A lot of people are terrified of heights. Typically this has something to do with the fear of **FALLING**, not the fear of height alone. However, I'm sure you've heard that it is not the fall that kills you...it's the sudden stop.

Whenever an amount of mass is in motion that object has **momentum**. During a collision, an object experiences a force that changes its momentum, this is known as **impulse**. The key to breaking a fall deals with changing the amount of force experienced over time when an object hits the ground.



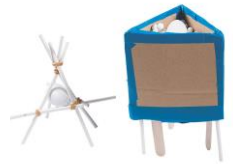
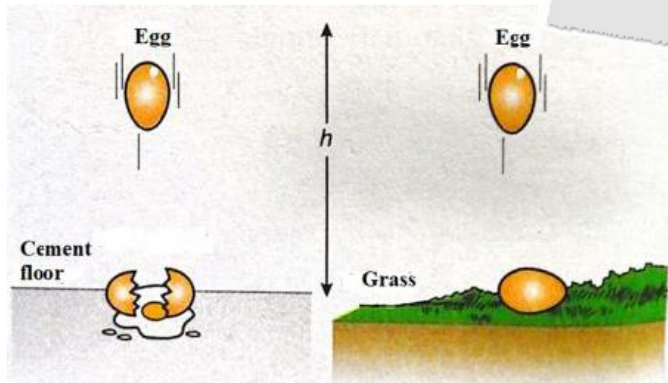
## **PROCEDURE:**

\*There is no official materials list for this lab. Simply use what supplies are available to build something that will protect an egg from breaking when it falls.

1. Build your device to hold the egg.
2. Test your device by dropping it outside on a hard surface.
3. If unsuccessful, improve your device.
4. Retest the newly improved device.
5. Sketch your successful device.



DEVICE SKETCH



## **LET'S APPLY**

1. What specific components of your device made it successful in protecting your egg? Explain how.
2. How does the surface the egg is dropped on play a part in successfully shielding the egg?
3. The minimum force required to break a common egg is 25N. Impulse = Force x Time
4. If your egg's Impulse was 100 Ns and it collided with the ground for 5 seconds. Would the egg break? Justify using calculations.
5. Assuming the impulse is the same, what if the egg collided with the ground for 4 seconds? Would it break? Justify.
6. Examining your answers in #3, how is **TIME** related to successfully shielding an egg from breaking?