Mega Egg Drop Lab

Purpose: Use the laws of physics to discover the impulse created by dropping an egg from an elevated surface. The goal is to protect the egg from breaking while experiencing the greatest amount of impulse as it collides with the ground.

Materials: Household items excluding submersible solutions, motorized devices, parachutes, kites, etc. All materials must be approved by instructor.

Procedure:

1. Use household materials to construct an apparatus to protect an unboiled egg as it is dropped from an elevated surface onto flat ground.
2. Must have an annotated, detailed sketch of the apparatus including at least two views, including a side and top view.
3. Once the apparatus is built, measure its mass without the egg.
4. Measure the vertical displacement that the egg will be dropped.
5. Load the egg into its protective apparatus and secure in place.
6. Drop the egg from the elevated surface and record the following data:
   1. Velocity of impact on ground.
   2. Δt during impact
   3. Force of impact
   4. Impulse of impact
7. Clean up the egg and apparatus and dispose of materials appropriately.

Data:

Record all observations and measurements obtained during the experiment. Find the values of each of the following quantities. Show all work and label your answers.

1. Mass of apparatus (without egg)
2. Vertical displacement
3. Velocity of impact
4. Δt during impact
5. Force of impact
6. Impulse of collision

Analysis:

1. What is impulse? Give another example of an object experiencing impulse other than this egg drop.
2. How are force and time during a collision in terms of impulse?
3. Was your experiment successful in terms of protecting the egg while experiencing a large impulse? Explain.
4. If given another opportunity, what modifications would you make to improve your results? Explain.