How does increasing the drop height affect the force on impact for a dropped egg?

Drop Height **(independent variable)**	**Landing Surface** **(CONSTANT)**	**Egg Size** **(CONSTANT)**	**Force on impact** **(dependent variable)**	**Did the egg remain safe, fracture, or break after landing?** **(directly related to dependent variable)**
1 meter	1 inch foam	Jumbo		
5 meter	1 inch foam	Jumbo		
10 meters	1 inch foam	Jumbo		

How does increasing the egg size affect the force on impact for a dropped egg?

Drop Height **(CONSTANT)**	**Landing Surface** **(CONSTANT)**	**Egg Size** **(independent variable)**	**Force on impact** **(dependent variable)**	**Did the egg remain safe, fracture, or break after landing?** **(directly related to dependent variable)**
5 meter	1 inch foam	Small		
5 meter	1 inch foam	Large		
5 meters	1 inch foam	Jumbo		

How does increasing the landing surface affect the force on impact for a dropped egg?

Drop Height **(CONSTANT)**	**Landing Surface** **(independent variable)**	**Egg Size** **(CONSTANT)**	**Force on impact** **(dependent variable)**	**Did the egg remain safe, fracture, or break after landing?** **(directly related to dependent variable)**
5 meter	Foam box	Jumbo		
5 meter	1 inch foam	Jumbo		
5 meters	Hard Floor	Jumbo		

1) Based on the data table above, in which case would an egg be most likely to break?

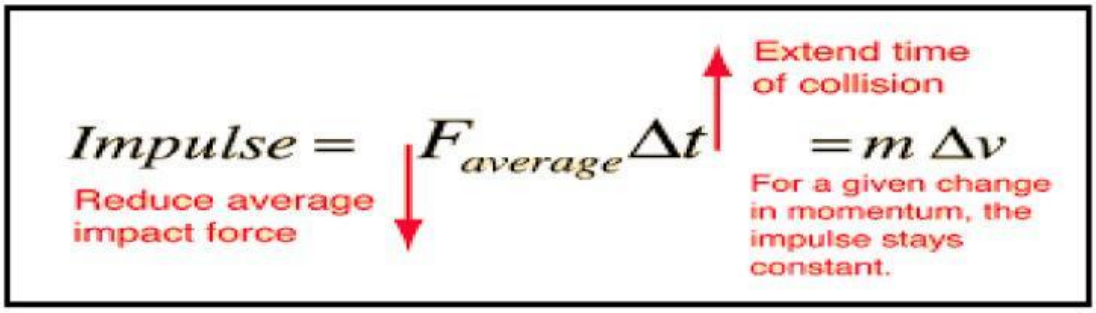
- Drop a small egg from 5 meters onto a hard floor
- Drop a small egg from 10 meters onto a 1 inch foam?

2) In this study, what was the purpose of changing only one variable at a time?

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In this study, what was the purpose of changing only one variable at a time?

The Impulse to momentum relationship is derived from an understanding of Newton's three laws of motion. It can be concluded from Newton's three laws of motion that the impulse of an object is equal to the object's change in momentum during a collision.



3) Define Impulse:

4) Define momentum:

When considering the collision of the egg with the floor, the egg starts out with a large downward momentum right before the collision takes place. After the collision takes place, the impulse produced from the ground changes the momentum of the egg to zero kg*m/s.

5) What factor was responsible for causing a large downward velocity of the egg right before impact? How would this affect the object's change in momentum?

6) Keeping the drop height constant, why was the Jumbo egg more likely to break upon impact than the small egg? How would this affect the object's change in momentum?

7) Keeping the drop height constant and egg size constant, why was the egg more likely to break on the hard floor as opposed to the foam block?

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Post lab questions

8) If you had to fall from a height that is high off the ground, which of the following would effectively reduce the average force applied to your legs upon impact?

9) If you are driving down the road and you get involved in a head end collision, the airbag will typically deploy on impact. Use the impulse to momentum relationship to explain how this helps keep you safe.

10) If you go to the driving range to hit some golf balls, the final speed of the golf ball is actually higher than the final speed of the club face after the ball is hit. Which statement best explains why?

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