



Curiosity Guide #303

Momentum

Accompanies Curious Crew, Season 3, Episode 3 (#303)

Egg-plant

Investigation #10

Description

Throw an egg and watch what happens!

Materials

- Raw egg
- 2 chairs
- Large sheet

Procedure

- 1) Take two chairs outside.
- 2) Separate them by about two feet, with their backs facing you.
- 3) Drape a sheet over the two chairs so that some of the sheet is on the ground.
- 4) Throw a raw egg in the center of the draped sheet. Be careful not to hit a chair.
- 5) Did the egg break?

My Results

Explanation

When you throw the egg at the sheet, the egg has momentum because it has mass and it is in motion, or has velocity. To stop the egg, another force has to be applied. If the egg were to hit the ground, all the force to stop the egg would happen at the same time. But if you can slow down the egg so it didn't get stopped all at once, the force to stop the egg can be less. When the egg hits the sheet, the sheet also moves, making the collision last longer. Spreading out the length of the collision reduces the force on the egg enough that the egg won't break. So, it is possible to change the egg's momentum by adding the stopping force over a longer or shorter time interval. This is referred to as the **impulse**, which equals the product of a force and a period of time. For example, when a car hits a tree, the passenger continues to move forward because of momentum, but the seatbelt and air bag transfer that momentum by applying an additional force over a period of time to slow the person's momentum.

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