Egg Inertia

The laws of motion are all around us! Newton's first law of motion states that an object in motion will stay in motion, unless acted upon by another force. Imagine rolling a ball on your table. That ball is going to keep rolling until something else happens to it! Maybe it slows down because of friction on the table, or you put your hand in front to stop it, or it rolls off the table! Another force we see often is inertia. Inertia is the tendency of a moving object, to stay in motion. In a car, if you slam on the breaks, you would keep moving. This is why we have seatbelts - to control the inertia of us moving inside the car.

In this experiment, we will get the egg (or a ball for an easy cleanup) into a cup without touching the ball, by using force! The egg or ball in your experiment is balancing on a toilet paper tube and pie tin, and is still - it wants to remain this way. When you knock the pie tin sideways, you are exerting a force, and moving the pie tin out of the way. The lip of the pie tin transfers this force to the toilet paper roll, also moving this out of the way. For a split second, the egg is stationary, until gravity pulls the egg down, and into the cup!

Supplies

An egg or tennis ball
Cardboard toilet paper tube
Pie tin
Heavy cup or glass

Challenge

How can you use physics and force to accomplish this challenge?

1. Place your cup on a flat surface - make sure there is room around the cup

2. Directly in the middle on top of the cup, place the pie tin

3. Directly in the middle of the pie tin, place the toilet paper tube

4. On top of the tube place the tennis ball

5. With one firm and swift whack, hit the side of the pie tin horizontally to push it out of the way - if done properly, the tube and pie tin will move out, and the ball will fall into the cup!

Questions

1. What forces are being used in this experiment?

2. What other forces are still acting on this? Friction? Etc.

3. What forces of physics do you see in your everyday life?

4. What ways can you change this experiment to get the same, or different results?