Curiosity Guide #309
Inertia

Accompanies Curious Crew, Season 3, Episode 9 (#309)

Egg Drop

Investigation #1

Description

Try this fun demonstration of Newton's First Law of Motion!

Materials

- Wide-mouth glass or jar
- Water
- Pizza pan or pie tin
- Empty toilet-paper tube
- Hard-boiled egg
- Table
- Broom

Procedure

1) Fill the wide-mouth glass or jar half-full of water.
2) Place the glass near the edge of a table.
3) Carefully balance the pizza pan on top of the jar of water so that the pan is centered. The edge of the pan should hang over the edge of the table.
4) Stand the toilet-paper tube on end. Center the toilet-paper tube on top of the pizza pan and directly over the jar of water.
5) Lay the hard-boiled egg on its side on top of the toilet-paper tube.
6) Stand the broom on the floor beside the table.
7) Step on the base of the bristles to hold the bottom of the broom in place.

8) Gently pull the broom back away from the pie pan.
9) Release the broom handle.
10) The broom should spring back and hit the edge of the pie pan.
11) What happened?

My Results

Explanation

Could you get the egg to drop inside the jar? This is a good example of Newton's First Law of Motion or the Law of Inertia. Newton's First Law of Motion says that an object that is still or at rest will stay at rest, while an object in motion will keep moving unless another force acts on it.

At the beginning of the investigation, the egg, paper-towel tube, pan, and jar were at rest. Gravity was pulling down on each object. An opposite force, called the *normal force*, was pushing up, so nothing was moving. When the broom hit the pie pan, a new force was added. The new force caused the pan to accelerate out of the way.

The tube, which was in contact with the pie pan, experienced less force from the impact. The egg experienced even less force. Because the force of gravity acting on the egg was much greater than the new force from the striking broom, the egg fell straight down into the jar.

Did this investigation whet your appetite for more? You can try other variations of this investigation by adding more jars, paper-towel tubes, and eggs. You can also substitute the egg with objects with different masses to see what affect that has on Newton's First Law of Motion, the Law of Inertia. Keep experimenting!

Parents and Educators: use #CuriousCrew #CuriosityGuide to share what your Curious Crew learned!

Curious Crew is a production of Michigan State University.
Learn more at WKAR.org.