

Crazy Egg Drop aka: Newton's First Law of Motion

Materials:

A pie plate

An empty cardboard toilet paper tube

A raw egg (yes, raw)

Water

A large drinking glass or flower vase



Procedure:

1. Fill the flower vase with water (about $\frac{3}{4}$ full).
2. Place the pie plate on top of the vase.
3. Carefully place the toilet paper tube on top of the pie plate, positioning it over the water.
4. Set the egg on top of the toilet paper tube - make sure to place the egg on its side, not how you'd find it in an egg carton.
5. Get ready to smack the pie plate, but first ask your child what he or she thinks might happen to the egg when you smack its support out from under it? Then, using your dominant hand, and starting from about 30 cm away, smack the side of the pie plate horizontally. It is important to hit the plate horizontally, and don't be shy - give it a good solid whack.
6. Observe what happens to the egg.

The Science Behind Crazy Egg Drop

Did you see the egg drop into the glass of water, instead of flying away with the pie plate and toilet paper tube? Is that what you expected? Why do you think this happened?

The scientific explanation is that the egg is following Newton's First Law of Motion which states that **an object at rest tends to remain at rest, and an object in motion tends to continue moving in a straight line at constant speed unless an outside force acts upon it.**

The egg is not moving when it sits on top of the cardboard tube - it is at rest. When you hit the pie plate with force it causes the pie plate to fly out from under the egg. The toilet paper tube gets caught on the edge of the pie plate making it fly away too.

But the egg is not caught on anything, so for a fraction of a second, the egg stays at rest in the air, even after losing its support, until the force of gravity pulls the egg towards the ground - or in this case, the vase of water. The egg stays in motion heading down into the vase, until the force of the water hits it, breaking the fall and causing the egg to come to rest, unbroken, in the vase.

Crazy huh?