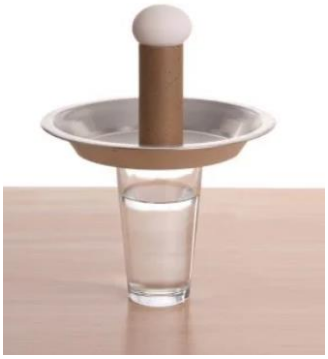
# The Egg Trick Challenge.

The goal of this experiment is to get the egg into the glass of water, but you're not allowed to touch the egg, the cardboard tube or the glass of water. The only thing left for you to touch is the pie pan. What would you need to do to move the pie pan and cardboard tube out of the way in order for the egg to fall into the glass of water? That's right . . . you're going to invoke Sir Isaac Newton's First Law of Motion and smack the pie pan out of the way.

**Don't do it just yet . . . read all the steps first.**



## EXPERIMENT MATERIALS

Large eggs (hard boil first because you need the practice)
Cardboard tube from an empty roll of toilet paper
Metal pie pan
Water
Large drinking glass
Oh, you might need a few paper towels to clean up your practice mess!

1. Pick a sturdy table or counter surface to perform the experiment (one that can get wet if it doesn't go to plan!).
2. Fill a drinking glass or plastic cup about three-quarters full with water and centre the pie pan on top of the glass.
3. Place the cardboard tube vertically on the pie pan, positioning it directly over the water. Carefully set the egg on top of the cardboard tube on its side.
4. Stand directly behind the Egg Drop setup. If you're right handed, hold your right hand straight out like you were going to karate chop something. Position your hand about 10cm away from the edge of the pan. The idea is to hit the edge of the pie pan with enough force to knock the cardboard tube out from under the egg. Gravity will do the rest as the egg falls directly into the glass of water.
5. https://youtu.be/zEueIWMRXNQ to see this experiment.

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## The science behind it:

Credit for this one has to go to Sir Isaac Newton and his **First Law of Motion**. Newton said that objects in motion want to keep moving and objects that are stationary want to stay still—unless an outside force acts on them. So, since the egg is not moving while it sits on top of the tube, that's what it wants to do—not move. You applied enough force to the pie pan to cause it to zip out from under the cardboard tube (there's not much friction between the surface of the pan and the water container). The edge of the pie pan hooked the bottom of the tube, which then sailed off with the pan. Basically, you knocked the support out from under the egg. For a brief nanosecond or so, the egg didn't move because it was already stationary (not moving). But then, as usual, the force of gravity took over and pulled the egg straight down toward the centre of the Earth.

Also, according to Mr. Newton's First Law, once the egg began moving, it didn't want to stop. The container of water interrupted the egg's fall, providing a safe place for the egg to stop moving so you could recover it unbroken. The force of gravity on the egg caused the water to splash out, and the audience burst into spontaneous applause.

## Take it further:

Try testing longer cardboard tubes from a roll of paper towel, different size glasses or different size eggs. Do small eggs work as well as jumbo eggs?

The true Egg Drop connoisseur will never be content with a single egg falling into a single glass. The temptation is just too great to push the envelope and find a way to position two eggs, side by side, and attempt a drop. When it works (and it will), you'll discover that two eggs just aren't enough. After searching day and night for weeks on end (or maybe you'll just find one lying around the house), you'll find the perfect tray to hold three cardboard tubes and three eggs. It's no longer a science experiment . . . it's an obsession with the law of inertia and gravity.

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