

Pulling a Fast One

You can amaze your friends by pulling a cloth out from under a plastic cup of water without spilling a drop!

Be sure to practice this many times. You may want to put some newspaper on the floor to catch some spills as you practice.

What you need:

Plastic cup

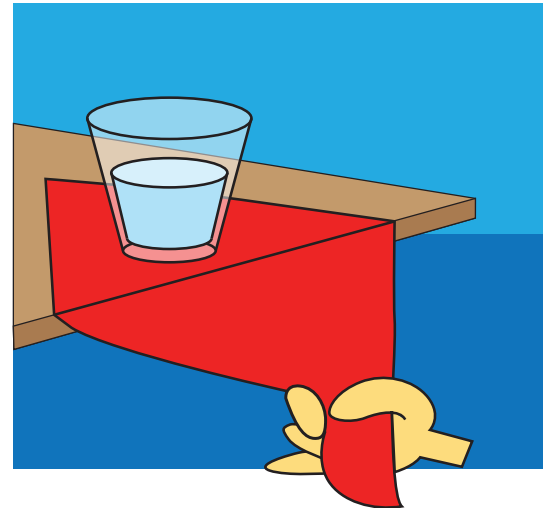
Table

Water

A cloth napkin

Newspaper or paper towels to soak up any spills!

Directions: Unfold the cloth napkin and drape it over the edge of a table as seen in the illustration.



Fill a plastic cup a little more than half full with water. Place it on the middle part of the napkin on the table.

Grasp the edge of the napkin that is hanging over the table edge. Give it a quick, hard pull.

Did the cup of water stay on the table? You may have to practice this a few times to get it right.

How did that happen? Why didn't the cup get pulled off the table with the napkin? Write down why you think this happened.

ANSWER: Isaac Newton's First Law of Motion applies here. The principle of **inertia** states that an object at rest will stay at rest until a force strong enough to change its position acts upon it. The sudden force of yanking away the napkin is applied only to the napkin. If it is done smoothly and quickly, that force will not act on the cup of water—which stays at rest. You just demonstrated the principle of inertia!