

Science Friction

Can you lift a bottle full of rice with a chopstick? Let's try it and learn more about physics and the science behind friction!

Materials

- Empty plastic bottles (clean & dry)
- Plain white rice--enough to fill the plastic bottles
- 1 Chopstick
- 1 Funnel (or piece of paper that curve and be used as a funnel)

Instructions

1. Pour rice into a bowl for easy access
2. Place funnel into bottle
3. Scoop rice and pour into funnel (that is already in the opening of the bottle)
4. Bang the bottle gently on the table to settle the rice (key point)
5. Continue until mostly full
6. Place the chopstick into the bottle
7. Work it into the rice, gently banging the bottle to get the chopstick worked well into the rice
8. Once worked into the rice, grab the chopstick and try to lift the bottle
9. Observe.

The Science Behind it

Friction is a force we experience every day, all day. We can't see it. So, we tend not to notice it. Friction is the force that opposes the movement of one substance against another. In this case, we had rice and a chopstick. As the rice sits in the bottle, there are air pockets around most grains, which prevents friction.

As we push the chopstick into the bottle, the grains of rice settle close to one another eliminating most of the air pockets. Once this happens, the frictional force overwhelms the rice and so the rice will push against the chopstick. In fact, the grains are pushing so forcefully, they create a force that causes the chopstick to become stuck enabling you to pick up the bottle of rice