

Dynamics and Statics

Gravity and Friction

Background

This demonstration looks at both the force of gravity and the force of friction. Gravity acts all the time, friction only acts briefly. The consequence is that the seemingly improbable, actually happens

You will need...

- ✓ Two identical glass jars,
- ✓ two identical plastic containers,
- ✓ a place mat (for a dinner plate),
- ✓ two balloons filled with sand.

Follow these steps

1. Position the “place mat” with its smooth face in contact with the rims of the glass jars.
2. Place the plastic containers on the rough upper surface of the mat, directly above the jars.
3. Place the balloons containing sand on top of the plastic containers. While holding the glass jars securely with one hand, slap the edge of the place mat horizontally with your other hand.

So what happened?

As the mat moved quickly in a horizontal direction, the plastic containers scattered out of the way and the balloons dropped into the jars. Friction only acted very briefly but for long enough to take the plastic containers out of the way. The force of Gravity acted continually on the balloons (containing sand) causing them to fall down into the jars.

What next?

Try the magician’s trick of pulling the table cloth from under the best china tea set you can find (with care!) or alternatively pull a sheet of paper from under a book or a cup.

