

Rolling jars of sugar

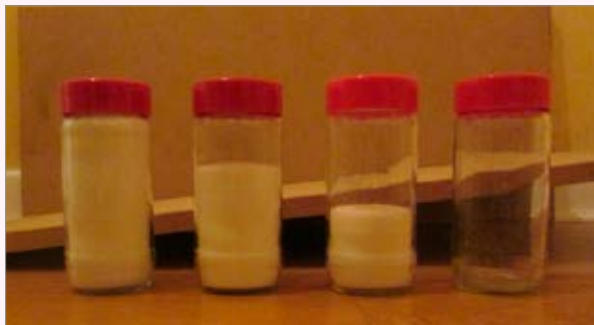
(Ireland)

Background:

Heavy and light fall objects at the same rate but do they roll at the same rate down an incline?

You will need...

- ✓ Four identical jars,
- ✓ Sugar,
- ✓ A ramp
- ✓ A meter stick



Follow these steps

1. Fill one jar with sugar. Add sugar to another until it is two-thirds full. Add sugar to another jar until it is one-third full. Leave the fourth jar empty.
2. Incline the ramp as shown. Place the four jars on their side (in a horizontal row) at the top of the ramp.
3. Hold them in a line with a meter stick. Release them to roll at the same instant.

So what happened?

They all rolled down the incline at different rates. Full and empty arrived together, followed by the jar that was two-thirds full, and in last place is the jar that was one-third full.

What next?

Examine either of the partially filled jars as it rolls and the sugar will be seen to cascade over, causing a braking effect. The effect is greater in the one-third full jar and its inertia is less than the two-thirds full jar. For a combination of these reasons the outcome is as described above.