



Curiosity Guide #209

Friction

Accompanies Curious Crew, Season 2, Episode 9 (#209)

Spinning Lid

Investigation #6

Description

Have you lost your marbles? No? Then try this cool experiment to find out more about friction.

Materials

- Soup can, unopened
- Plastic lid that will fit over can
- Marbles
- Pencil or wooden dowel
- Clay

Procedure

- 1) Secure a lump of clay on the top center of the plastic lid.
- 2) Stick the pencil or dowel so that it lies flat on the lid and is held in place with the clay.
- 3) Add lumps of clay to each overhanging end of the pencil or dowel.
- 4) Place the lid on the top of the soup can.
- 5) Take one end of the overhanging dowel and gently spin it.
- 6) Place marbles on the top of the can.
- 7) Lay the lid on the marbles.
- 8) Take one end of the overhanging dowel and gently spin it again.
- 9) Does it spin well?

My Results

Explanation

The marbles on top of the soup can are held in place between the lip of the can and the overhanging lid. Because they are able to roll in place, there is less **friction** than when the lid is placed directly on the can and spun that way. **Bearings**, like the marbles, are used as one method to reduce **frictional resistance**.

Think about this! Engineers use ball bearings to help reduce friction between two solids, but they also have to think about friction between solids and fluids. The space shuttle is a good example. When the shuttle re-enters the earth's atmosphere, it rubs on the air molecules. This creates so much friction and heat that the shuttle could melt! That's why the underside of the ship has heat-resistant tiles to protect the ship and the passengers from all that **fluid friction**. Amazing!

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