Curiosity Guide #205
Flowing Air

Accompanies Curious Crew, Season 2, Episode 5 (#205)

Sticky Spool

Investigation #4

Description

Mystify your friends with this demonstration of Bernoulli's Principle.

Materials

- 3 by 5-inch notecard
- Pushpin
- Wooden spool

Procedure

1) Demonstrate how easy it is to blow a notecard when held in front of your mouth.
2) Stand the wooden spool on end so that one of the holes is facing up.
3) Place the notecard so that it is centered and balanced on the spool.
4) Pierce the pushpin through the notecard so that it goes into the hole of the spool.
5) Pick up the spool with one hand. Hold the pushpin in the other hand so it is pressed against the spool.
6) Have a friend predict what will happen when you blow into the other side of the spool.
7) Try it! With a steady breath, you should be able to let go of the pushpin, and the notecard will stay there.
8) Try blowing it downward as well.

My Results

Explanation

The faster-moving, blown air results in lower pressure between the card and the spool. This is called Bernoulli's Principle. The partial vacuum under the card is out of balance with the high pressure on the outside of the card. So long as the air is moving, the card will remain with the spool, even when blowing downward. When the flow of air stops, the pressure balances. The card will fall away from the spool.

Something else to try: Here is a fun way to see Bernoulli's Principle with fluid water. Attach a Ping-Pong ball to a string with tape. Hold the ball by the string near the kitchen faucet. Turn on the stream of water. The ball will swing into the stream and stay there. The fast-moving fluid of water has a lower pressure than the still air beside it, so the ball gets pushed into the stream and is held in place. Pretty cool!

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