

Motion

Running Time: 26 Minutes

Nifty questions in this episode:

- What puts things in motion?
- What is a property of matter?
- What are Newton's Three Laws of Motion?

Awesome answers:

- Forces (push-pull).
- Inertia.
- (1) A body at rest will remain at rest unless acted upon by an unbalanced force. (2) Acceleration of a body depends upon its mass and the force applied to it. (3) An action will cause an equal and opposite reaction.

Experiment shown on the video:

SWIFT MOVE

Objective: To demonstrate that things at rest stay at rest until acted upon by an outside force.

- Place a playing card on top of an empty water glass. Place a quarter on top of the card.
- With one or two of your fingers, strike the playing card sharply along its edge with a quick horizontal motion.
- The card should slide off the top of the glass, causing the quarter to fall into the glass.

More interesting stuff to do:

FROM AIR TO ETERNITY

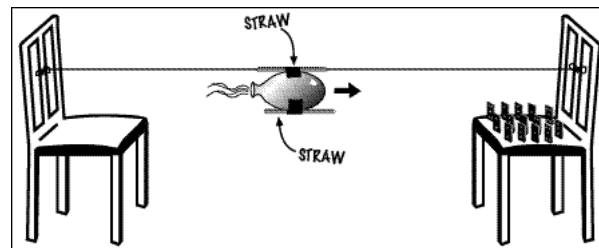
Objective: To demonstrate how the force of air moves an object at rest.

- Use a strip of masking tape to divide a tabletop in half along its width. With tape, mark a "goal" or target area at each end of the table.
- Stand at one end of the table with an opponent at the other end. Place a Ping-Pong ball on the tape in the middle of the table. Use air from a handheld bicycle-tire pump to force the ball into the goal, while your opponent tries to do the same from the opposite direction.
- Play the same game using balloons instead of tire pumps. Blow up the balloon, hold its neck, and release the air when needed.
- Tape additional targets around the table and try to hit each target with one blast of air.
- Try blowing through a drinking straw to move a cotton ball to a designated target using just three blasts of air.
- Write a summary of the best and worst methods for using air to move an object.
- Which of Newton's Laws apply in this experiment? In a frictionless environment, how far would balls travel?

ACTION, ACTION, WE GOT REACTION!

Objective: To demonstrate how forces can produce an action causing a reaction.

- Tie the end of a piece of 4-foot-long string to the top of the back of a chair. Thread the other end of the string through a drinking straw and tie it to the back of another chair.
- Position the chairs so that they are facing each other and the string is as tight as possible.
- Line up 10 dominoes, standing on end, on the seat of one chair.
- Inflate a large balloon, twisting the neck so air won't escape. Have a friend cut and hold four pieces of tape each 3" long. Use two pieces of tape to attach the balloon to the drinking straw on the string. Tape another straw parallel to the first on the opposite side of the balloon. One end of the second straw should be halfway back from the opening of the balloon so that the other end of the straw protrudes about 3" past the end of the balloon.
- Start with the balloon at the chair opposite the dominoes. Aim and release the balloon. The goal is for the protruding end of the lower straw to strike the dominoes and knock them down. Adjust the position of the straw and tautness of the rope as necessary and keep trying.



closed-captioned



Disney Educational Productions

105 Terry Drive, Suite 120
Newtown, PA 18940-3425
1-800-295-5010



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