Air Puck Physics Kit

P4-2155

INSTRUCTIONAL GUIDE

Contents

- 2 Air-Powered Pucks
- 1 Air Puck Launcher
- 1 pair hook-and-loop bands
- Air Puck and Air Puck Physics Kit Instructional Guide

Instructions

Launcher: You can use the front or back pegs and one or two bands to achieve different launch speeds. Hold the launcher down firmly with one hand while you pull the puck completely back with the other hand.

For Inelastic Collisions: Stretch the two hook-and-loop bands around each of the two pucks. When the pucks collide, they will stick together instead of bouncing apart.

Experiments

1. **Friction vs. Frictionless:** Compare the Air Puck's motion to that of a block of wood or sliding rubber tire. Discuss the effects of friction on the different surfaces.
2. **Law of Inertia:** Since the Air Puck's motion is nearly frictionless, it makes an excellent example for teaching Newton's First Law. The puck moves in a straight line at a constant speed until an outside force acts on it. Try to make the puck slow down, speed up, or turn! What types of forces can you use without touching the puck?
3. **Centripetal Motion:** Attach a long elastic band to the puck and loop the free end around a round table leg. Push the puck in a circle and observe the effect of increasing speed on the stretch in the elastic band.
4. **Collisions and Conservation of Momentum:** The pucks' rubber bumpers make excellent elastic collisions—with each other or solid objects like walls. Add the hook and loop bands to make inelastic collisions. More tips for collisions:
    a. Add mass by affixing rings of modeling clay. The clay must be evenly distributed around the puck, and must not block the air intake. Be careful not to add so much that the puck doesn't glide smoothly.

b. Analyze the motion with video analysis. Commercial programs are available, or you can simply view frame-by-frame video (filmed from directly above) on a monitor and mark the positions of the pucks as they move through each frame. Students can create a "cm per frame" analysis of relative speed.

c. Analyze the motion with computers. Add flags to the pucks so that their motion can be captured by motion sensors. This system works best for linear motion.

Submit your Idea!

Do you have a solution for using the Air Puck for quantitative labs? Send it to: helpdesk@arborsci.com.

Related Products

Air Track and Air Source with Accessories (P4-2710) For studying linear frictionless motion.

Dynamics Carts (P3-3530) Traditional apparatus for studying motion and collisions.

Liquid Accelerometer (P3-3525) Colored water in this transparent cell shows the magnitude and direction of linear or centripetal acceleration. Fits on our dynamics carts.