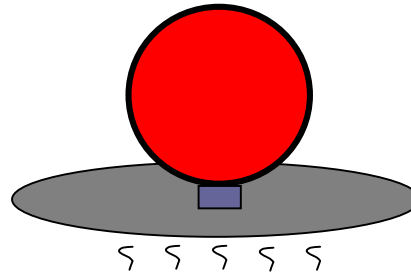


Materials List

- ✓ CD
- ✓ Balloon
- ✓ Suitable cap
- ✓ Means to make a hole in the cap (nail and hammer, drill)
- ✓ Hot glue gun



Frictionless Puck*



Introduction

In a similar fashion to the arcade game “Air Hockey”, this activity involves floating a disk on a thin layer of air to reduce the effects of friction.

To Do and Notice

- Begin by making sure you have a suitable cap, which is any plastic cap that is larger than the hole in the center of the CD and that you can make a small hole in without cracking the cap.
- Make a small hole in the lid either by using a drill or taping a nail through with a hammer, and then glue the lid with the open end face-up over the hole in the center of the CD. It works better if the lid is glued to the unlabeled side of the CD.
- Place the balloon over the cap; inflate the balloon by turning over the CD and blowing through the hole in the cap. Pinch the balloon’s neck to keep it inflated as you are blowing.
- Keep the balloon pinched off once you are done inflating the balloon, and set the CD down on a smooth flat surface. Give the CD a gentle nudge as you release the balloon’s neck and watch it go!

Science behind the Activity

Since the air in the balloon is at higher pressure than the air in the room, it comes out through the hole in the center of the CD. Since air occupies space, it lifts the CD just slightly off the surface of the table as it moves toward the edges of the disc. This reduces the friction between the disc and the table and allows the CD to glide along once it has been pushed.

Extensions

- Experiment with the effects of having different size holes in the cap; see how hole size affects the CD’s speed, its distance traveled with a small push, or its glide time.
- Experiment with having different weights due to different caps or balloons; see what size of hole works best for heavier set-ups (if it is too heavy it won’t work).
- Make a small hole in the side of the cap to create a forward force.
- If the balloon flops over and makes the experiments harder to do, you can create a small “collar” for the balloon using a portion of a toilet paper roll. Cut a vertical slit along the length of the collar (which can be of varying heights depending on the balloon you are using) so that you can still pinch the balloon closed. Glue this collar to the CD.

*This is an adaptation of an idea from Paul Doherty of the Exploratorium Teacher’s Institute.