

Playful Science 1

Free Experiment!

**The Disk That Seems
to Defy Gravity**



**A project of
Research Node in Science
Technology and Education**



The Disk That Seems to Defy Gravity



WHAT YOU NEED

- A LIGHTWEIGHT PLASTIC FRISBEE
- A MEDIUM-SIZED LATEX BALLOON
- A STRAIGHT DRINKING STRAW
- ADHESIVE TAPE
- SCISSORS

There is something we learn very early on: objects fall. If we drop a ball, a book, or a coin, all of them move toward the ground in a familiar way. We call this constant, silent, and inevitable force gravity. The experience is so ordinary that we stop questioning it. We simply assume that things behave “the way they should.”

But suddenly, a phenomenon appears that breaks this expectation. An object that does not fall immediately. A motion that seems to correct itself. A trajectory that does not match what we anticipated. When this happens, an uncomfortable but valuable feeling arises: something does not fully fit with what we believe we know.

The experiment you are about to build produces exactly that sensation. It consists of a disk made from simple materials —without motors, without magnets, and without hidden mechanisms. When put into operation, the disk descends slowly, remains stable, and at times seems to defy gravity. Of course, it does not, but the appearance alone forces us to think. We are not looking for spectacular effects, only careful observation. Before explaining, it is better to watch. Before naming physical laws, it is better to let the phenomenon speak for itself.

This experiment does not aim to show that gravity disappears, but something far more interesting: that it never acts alone. Through careful observation and direct experimentation, you will discover that invisible forces —such as air— can profoundly alter the motion of objects. Science does not begin with answers, but with a sense of wonder guided by observation.

How to Build It



What is this for? The purpose of this activity is to build a simple device that allows us to observe how air, when released in a controlled way, can modify the motion of an object. The goal is not to produce a spectacular effect, but to prepare a stable system that makes the interaction between forces visible.

1. Prepare the disk. Locate the center of the frisbee or plastic plate. Using scissors or a pointed object, make a small, clean hole. The size should allow the straw to fit tightly, without gaps.
2. Insert the straw. Insert the straw straight through the hole. It should pass through the disk and extend slightly on both sides. Make sure it is firm and properly centered.
3. Attach the balloon. Place the deflated balloon over the upper end of the straw. Adjust the latex carefully and, if necessary, reinforce the seal with adhesive tape. Check that air can escape only through the straw.
4. What you will do next will allow you to observe how the device behaves when the air begins to escape and to explore how small modifications influence its stability and motion.

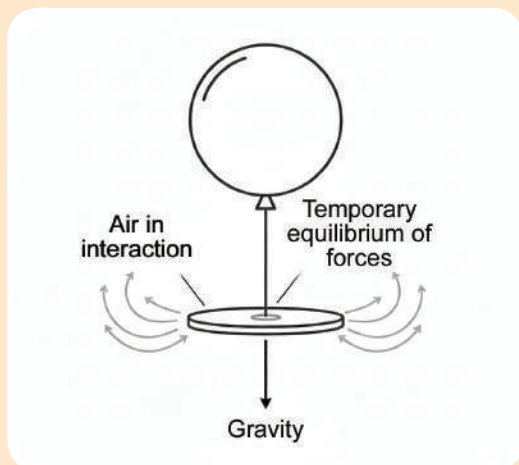
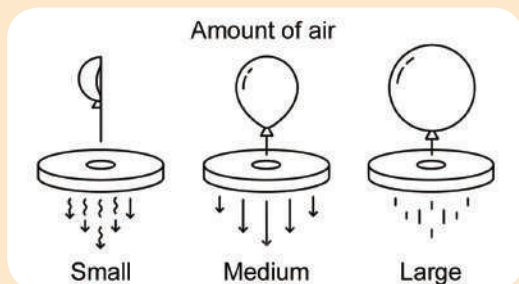
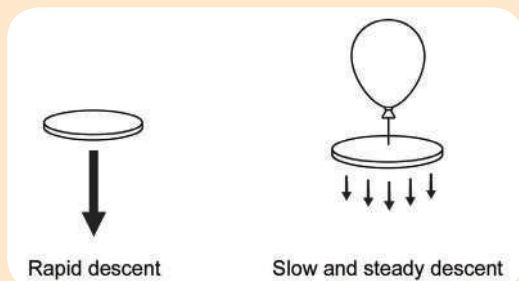


5. Inflate the balloon, but do not fill it to the maximum. Keep the lower end of the straw closed with your fingers. Hold the disk in a horizontal position, about 20 to 30 centimeters above a smooth surface.
6. Release the disk without throwing it and let the air escape at the same time. Observe how it descends and remains stable for several seconds.
7. Repeat the procedure, changing only one condition at a time. Try more or less air in the balloon. Slightly tilt the disk before releasing it. Change the height from which you let it go. In each case, observe carefully what changes and what remains the same.
8. Do not try to explain what happens yet. At this stage, what matters is to record the behavior of the disk and compare the results.



9. You can decorate your disk however you like: give it the appearance of a UFO or design it in a creative way. Make sure the decoration does not affect its balance. Then, surprise others with a demonstration.

What to observe



When the disk is set in motion, the first thing that stands out is that it does not fall abruptly. Instead of descending straight down, its movement becomes slower and, at times, surprisingly stable. Observe whether the disk maintains an almost horizontal position and how it reacts when it tilts slightly. In many cases, it will seem to correct its posture as it descends.

Also pay attention to the duration of the motion. How long does it remain stable before reaching the surface? Compare that time with that of a similar object falling without the balloon inflated. The difference is an important clue.

Observe what happens when you change only one condition at a time. With more air in the balloon, does the descent become slower? With less air, does it lose stability more quickly? If you tilt the disk before releasing it, does the tilt remain or does it correct itself during the motion? These details are not secondary: they reveal how different forces interact at the same time.

Pay close attention to the role of air. Although we do not always see it, here it appears as an active agent, capable of pushing, supporting, and modifying the disk's motion. Gravity continues to act, but it does not act alone. The behavior of the object depends on the balance between forces acting simultaneously.

Before looking for formal explanations, pause and reflect on what you have observed. Describe what happens in your own words, record comparisons, and note any regular patterns. Scientific understanding begins when we learn to look carefully at what, at first glance, seemed impossible.