

Balloon Air Pressure Magic

Warning all grownups: get your sense of humor ready for this science experiment, which demonstrates fundamental physics of air pressure. You can do this in a lab, of course, or with technical worksheets, but we love this goofy “magic” trick with a kid and a grownup...and an audience, too, if you dare.

What You Need:

- 2 plastic drink bottles, 1-2 liters in size, clean and dry
- Latex balloons
- Pin or tack

What You Do:

1. Behind the scenes, begin with one plastic drink bottle and the tack. Without showing anyone in your potential audience, press the tack into the plastic to make a small hole in the bottom of the bottle. Widen it so that your hole ends up about 1/8” across...if it's a little bigger, that's okay too.
2. Now you'll need two volunteers—preferably one who's a kid and one who's a big, burly teen or adult. Give the big guy the bottle without a hole, and give the kid the bottle with the hole. Now have each volunteer place a balloon inside the neck of the bottle and stretch the opening of the balloon over the top of the bottle, so that the opening is covered completely.
3. On the count of three, challenge the two volunteers to blow up their balloons. Get ready for some fun: the little kid's balloon should inflate just fine, making an attractive decoration inside the bottle. But the other one will just not inflate!
4. For a little extra fun, invite another volunteer to try, using a different balloon. You can also offer the bottle with the hole in it, but sneakily hold your finger over the hole...if you do that, the other balloon won't inflate either!



What's Going On?

When we blow up balloons, we move air into a compressed space and inflate the latex. But when the balloon is placed inside the bottle, and there's no way for the bottle's air to escape, the pressure inside the bottle is greater than the pressure that occurs from blowing on the balloon...and the balloon just won't blow up. When there's a hole at the bottom, however, the compressed air can escape, and the balloon can expand. It's good science...and for an elementary school kid, it's also some magical fun.

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