

Static Flyer – The Flying Bag



Charge a balloon and use the electrical charges of static electricity to create flying objects!

Who needs a magic wand to create levitating objects when you have a balloon? Well, if you know how static electricity works, you won't need a wand!

Materials

- Cotton towel
- Plastic produce bag
- Scissors
- Balloon

Experiment

1. Use a pair of scissors to cut a strip from the open end of the produce bag. Once the strip is cut, you should have a plastic band or ring.
2. Blow up a balloon to its full size and tie off the end.
3. Rub the cotton towel over the surface of the balloon for 30-45 seconds.
4. Flatten the plastic band on a hard surface and gently rub the towel on the band for 30-45 seconds.
5. Hold the plastic band about one foot over the balloon and release it. Holy guacamole... the plastic band is levitating!

How Does It Work?

Rubbing the towel against the balloon and the plastic band transfers a negative charge to both objects. The band floats above the balloon because the like charges repel one another. If you really want to impress someone, just tell them that it's a demonstration of “electrostatic propulsion and the repulsion of like charge.” That should do it.

When you rub a balloon on someone's hair the balloon picks up electrons, leaving it negatively charged and the hair positively charged. Because opposite charges attract, bringing the balloon near the hair causes the hair to stand up.

When you bring a charged balloon near pieces of paper, the paper isn't charged so you might expect nothing to happen. But the paper is attracted to the balloon. Why? The negative charge on the balloon repels the electrons in the paper, making them (on average) farther from the balloon's charge than are the positive charges in the paper. Because electrical forces decrease in strength with distance, the attraction between the negatives and positives is stronger than the repulsion between the negatives and negatives. This leads to an overall attraction. The paper is said to have an induced charge. This explanation applies to a charged balloon sticking to a wall and a charged balloon attracting other uncharged objects.