

Science Experiments

SCIENCE EXPERIMENTS

Be sure to ask your parents or an adult for help before trying any of our experiments.

Experiment #1

Ordinary people use standard electricity from the wall to power a light. Oh, but not you! Why use normal electricity from the wall outlet when you can make your own? Get ready to amaze everyone with this shocking display of science.

Materials:

- Fluorescent light
- Balloon
- Wool sweater

Experiment:

- Darken the room. Hold the fluorescent bulb in one hand and the balloon in the other. Rub the balloon vigorously on your hair.
- Bring the balloon near the bulb and watch what happens. Was that a flicker of light? Did the bulb really light up?
- Move the balloon up and down the bulb without touching the bulb. The light should sort of follow the balloon.
- Touch the balloon to the glass and see if you can get a spark to jump.
- You can't believe your eyes... so, go back to step 1 and do it again.

How does it work?

Electrons are relatively free to jump from one atom to the next, and they're attracted to some materials more than others. When you rub a balloon on your hair, electrons from your hair jump over to the balloon and stay there. The inside of a fluorescent tube is coated with a white material made up of phosphors. If you bombard phosphors with ultraviolet light, they re-emit visible light. In normal operation, the fluorescent tube is connected to a source of electrical current. The current supplies electrons that slam around inside the tube. Inside the tube there is also mercury vapor. When electrons collide with the mercury vapor, they cause the vapor to emit ultraviolet light, which hits the phosphors and the tube lights up. Bringing a negatively charged balloon near a fluorescent tube stirs up the electrons in the mercury vapor. This produces an electrical current, which excites the mercury atoms. The excited mercury atoms emit ultraviolet light and cause the phosphors to glow. When a spark jumps, you get a big release of energy and a correspondingly brighter glow.

Experiment #2

Cause a packet of ketchup to rise and fall on command in a bottle of water. People will think that you have the ability to move object with your mind! Telekinesis? No, just cool science!

Materials:

- Plastic soda bottle (1-liter size works great)
- Ketchup packets from a restaurant
- Tall drinking glass
- Soda bottle cap

- Water

Experiment:

- First, you'll need to perform a float or sink test to see how the ketchup packet works. Fill the bowl with water and drop the packet into it. If it floats, great! If it sinks to the bottom, no sweat. This shows that atmospheric pressure in the packet is pressing hard enough on the air bubble inside the packet to sink it. If this happens, you get to make more trips to your favorite fast-food restaurant to find a ketchup packet that just barely floats!

- Scrunch the packet in half lengthwise and carefully push it into the soda bottle. Fill the bottle full to the brim with water and screw on the cap. Squeeze the sides of the bottle and hold the squeeze to make the packet sink. Let go and it rises.

How does it work?

The packet floats because an air bubble gets trapped inside the packet when it's sealed at the factory. If the packet sinks when you test-float it, then the air bubble is too small to make it float. That's the easy part.

As you squeeze the bottle and push the water against the floating packet, you compress the air bubble into a smaller space. This happens because gases are more squishable than liquids. When you decrease the volume (making the bubble of air smaller), you increase the density of the packet and it sinks! When you release the pressure on the bottle, the compressed air expands inside the packet and the diver floats to the top of the bottle.