

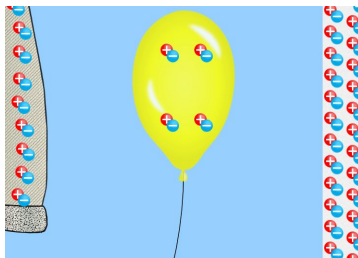


## Static Electricity Lab

### Part 1: Balloons

1.) Go to the following link:

[https://phet.colorado.edu/sims/html/balloons-and-static-electricity/latest/balloons-and-static-electricity\\_en.html](https://phet.colorado.edu/sims/html/balloons-and-static-electricity/latest/balloons-and-static-electricity_en.html)



2.) Start with just one yellow balloon.

- A.) How many protons does the balloon start with?
- B.) How many electrons?
- C.) Objects with the same number of protons and electrons are called: \_\_\_\_\_

3.) Rub the yellow balloon against the sweater.

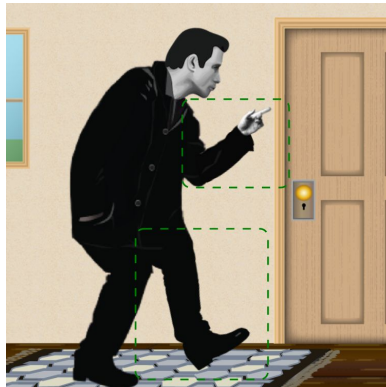
- A.) What happens to the charge on the balloon?
- B.) What happens to the charge on the sweater?
- C.) What moves during this process, electrons or protons?
- D.) Why do you think electrons are the ones that move and not protons?
- E.) Put the charged balloon next to the sweater. What happens? Why?
- F.) Put the charged balloon against the wall. What happens? Explain why you think this happens.

4.) Reset the yellow balloon.

- A.) Rub the balloon against the wall. What happens? Why is the result different this time? What did the sweater do that the wall did not during the rub? Give some thoughts to why this happened.

- 5.) Reset the yellow balloon and charge it by rubbing the sweater.
  - A.) Does the charged balloon stick against the wall?
  - B.) Is so, why? Look at the charges and give your theory as to why this happens.
- 6.) Select two balloons. Charge the balloons so that they repel each other. Explain what you did and explain why this happens?
- 7.) Put things together, what did you learn overall from this activity?

## Part 2: John Travoltage



- 1.) Go to the following link:  
[https://phet.colorado.edu/sims/html/john-travoltage/latest/john-travoltage\\_en.html](https://phet.colorado.edu/sims/html/john-travoltage/latest/john-travoltage_en.html)
- 2.) What causes John to get a charge? What did you do? Explain.
- 3.) Where do the charges that go into John come from?
- 4.) What in turn happens to the charge in the carpet?
- 5.) Now causes John to discharge through the doorknob. Give your observations.
- 6.) How is the distance John's arm is away from the doorknob related to when it discharges?
- 7.) Watch this short video: <https://www.youtube.com/watch?v=h-0gNI5f4BU>
- 8.) Explain how lightning is similar to this activity.
- 9.) On a side note, I've always noticed that spark when putting my key into a keyhole when the room is dark. Everytime!! Have you?

10.) Give a few other observations you found during this lab.

### Part 3: Questions

1.) ESD (electrostatic discharge) is shown below. Explain at least 3 events that can cause ESD to happen.



2.) As the person walks across the floor what happens to the charge of the floor?

3.) Watch a short video: <https://tinyurl.com/won8zxl>

What 3 suggestions are given in the video to minimize ESD?

4.) Sometimes shopping carts have a small metal cable which drags on the bottom as shown below. Explain the purpose of this cable.



- 5.) Watch the following video and explain how the anti static wrist bands work. What is the main mechanism used here?

[https://www.youtube.com/watch?v=\\_m\\_F4j-oQaU](https://www.youtube.com/watch?v=_m_F4j-oQaU)