Name Answers
Physics 200

Essex High School
April 5, 2017

Simulation: John Travoltage

Access: Go to http://phet.colorado.edu, click on "Play with Sims", then choose "Electricity, Magnets, and Circuits" simulation. Click on "John Travoltage" and click on "Run Now".

1) Use the mouse to rub his foot on the carpet. What do you observe?

Electrons enter his foot and spread throughout his body.

2) Why do the charges spread out?

They are all negative, so they repel one another

3) Use the mouse to bring his hand close to the door knob. What do you observe?

The electrons flow out of John and into the doorknob

4) Are the charges attracted to the doorknob? Why or why not?

The doorknob has a more positive charge and even though electrons are passing into the knob, they are spreading out evenly through the entire Earth, so the negative charge located in the knob does not build up.

5) Rub his foot on the carpet again. Why don't the charges leak back to the ground through his feet?

The soles of his shoes are insulators.

[When he first rubs his foot on the floor, there must be a high enough concentration of charge for electrons to flow from his soles to his feet.]

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Simulation: Balloons and Static Electricity

Access: Go to http://phet.colorado.edu, click on "Play with Sims", then choose "Electricity, Magnets, and Circuits" simulation. Click on "Balloons and Static Electricity" and click on "Run Now". Uncheck the box that says "Ignore Initial Balloon Charge".

1) Does the balloon have a net charge? How do you know?

Not in the beginning. It has equal numbers of positive and negative charges.

2) Does the sweater have a net charge? How do you know?

0 net charge. + charges = − charges

3) Use the mouse to rub the balloon on the sweater. What is the net charge on each object?

Balloon ⇒ negative
Sweater ⇒ positive

4) Use the mouse to move the balloon away from the sweater and release it. What happens? Why?

The balloon is attracted to the sweater because they have opposite net charges.

5) Move the balloon against the wall. Why does the balloon stick to the wall?

The negative balloon induces polarity in the wall. Electrons move into the wall, leaving the outside positive, so that it attracts the balloon.

6) Did the charge on the wall change?

Net charge did not change. The total number of positive and negative charges remained constant.

7) How do you think dryer sheets reduce static cling?

They distribute positive ions which stick to negatively charged clothing, canceling charge.