

3.3 Grade 9

CONCEPT 2

Charges can flow through conductors, but not insulators.

Activity

Charging Balloons

1. Wearing non-latex gloves, rub a rubber balloon with a wool cloth. Making sure the balloon does not touch anything, bring it near several tiny bits of paper.
2. Still wearing gloves, rub a metallic (mylar) balloon with a wool cloth. Bring the balloon near the bits of paper, being careful not to touch it to anything.
3. Repeat steps 1 and 2 without wearing the gloves.
4. Compare your observations. What differences do you observe among the four tests you completed? Suggest a reason for each difference you observed.



When two different solid materials are rubbed together, electrons can be transferred from one material to the other. The electrons will either stay on the surface of the new material or travel through it. Any material that electrical charges can move through is called a **conductor**. Electrons can move through almost all metals, but they move through some metals more easily than others. How easily the charges move through a material is referred to as its **conductivity**. A material through which charges cannot travel at all is an **insulator**.

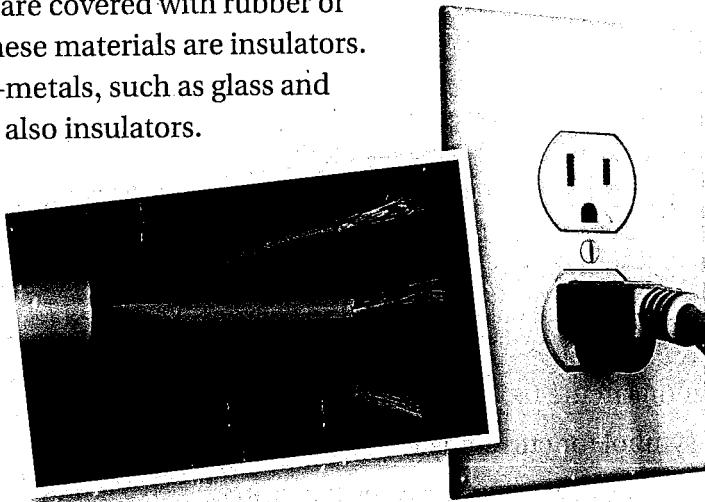
Look at **Figure 3.17**. Most electrical wiring is made out of metals that conduct charges very well, such as copper. Most electrical cords and wires are covered with rubber or plastic. These materials are insulators. Most non-metals, such as glass and wood, are also insulators.

conductor a material charges can travel through

conductivity an indication of how easily charges travel through a material

insulator a material charges cannot travel through

Figure 3.17 Electrical cords are made of a metal conductor covered by an insulator to prevent the charges from moving from one wire to the other. The insulator also prevents charges from moving to other objects, including you.



Before you leave this page . . .

1. Explain why electrical wires are covered by an insulator.