

9.3

CHECK YOUR Understanding

1. What is the difference between a conductor and an insulator? Give an example of each.
2. Which of the following materials are conductors?
 - copper
 - sulfur
 - glass
 - aluminum
 - gold
 - phosphorous
 - sodium
3. Explain why grounding an object makes the object neutral.
4. A positively charged rod is brought near, without touching, a metal sphere. A ground wire connects the opposite side of the sphere to the ground (Earth) (Figure 4). The ground wire is disconnected and the rod is taken away. What charge is left on the sphere? Use diagrams to explain your answer.

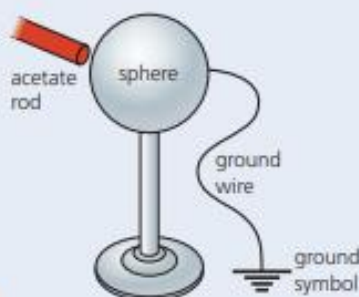


Figure 4

5. Figure 5 shows a lightning rod on the top of a building being struck by lightning. What are two characteristics of an effective lightning rod?



Figure 5

6. A student gives an electroscope a negative charge by touching it with a negatively charged vinyl strip (Figure 6). The student then brings a positively charged acetate strip near the electroscope. What happens to the leaves of the electroscope? Explain in terms of the movement of electrons.



Figure 6

7. When you walk across a carpet, a static charge may build up on you such that when you touch a metal doorknob, you may feel a shock.
 - (a) The effect is more noticeable on cold winter days than on warm summer days. Why do you think this happens?
 - (b) Explain why you would not feel a shock if you touched the wooden part of a door.
8. Using a paper towel and an acetate strip, you can give an electroscope a positive charge two different ways. Describe both ways of charging the electroscope.
9. Two objects, X and Y, are neutral. When they are rubbed together, object X loses electrons to object Y. What type of charge is on object X and on object Y? What would happen if object X was brought close to a negatively charged electroscope? Explain your answer.
10. A scientist rubs a stick of sulfur with a wool cloth, and then moves the sulfur near the ball at the top of an electroscope. The leaves spread apart. What is the charge on the leaves of the electroscope? Explain your answer.