

9.1

CHECK YOUR Understanding

1. Write a definition, in your own words, of the term “static charge.”
2. Give three examples of static electricity.
3. What type of charge does amber (Figure 6) acquire when it is rubbed with a nylon cloth? What type of charge does the nylon cloth acquire? How does the size of the charge on the amber compare with the size of the charge on the nylon cloth? (Hint: Refer to the electrostatic series on page 276.)



Figure 6

4. When an object is charged, does it remain charged forever? Explain your answer.
5. Is it possible to negatively charge a rod by rubbing it with a fabric without also giving the fabric a positive charge? Explain your answer.
6. If an electron is removed from a sodium atom, the atom becomes a sodium ion. What type of charge does a sodium ion have?
7. State the law of electric charges in your own words.
8. A plastic comb is used to brush the fur of a cat. The comb is then brought near some confetti lying on a table. The pieces of confetti are first attracted to the comb and then repelled. Draw diagrams to explain what happens. Make sure that you show the charges on the objects.
9. Suppose that you are given a metal sphere, a positively charged acetate strip, and a negatively charged vinyl strip. How could you determine the charge on the sphere using both strips? Why would you not be able to determine the charge using only one of the strips?

10. A student walks across a rug and notices a spark when she reaches for a metal doorknob. How could she determine whether she was positively charged or negatively charged?
11. A vinyl comb is rubbed on a wool sweater. The comb is brought toward some salt and pepper sprinkled on a countertop. The salt crystals are attracted to the comb and stick to the comb. The pepper is attracted to the comb at first, but then some of the pepper flies off. Explain the difference between salt and pepper, with respect to charges.
12. In a television, electrons travel between oppositely charged plates to the screen, as shown in Figure 7.
 - (a) Would an electron move toward the negatively charged plate or toward the positively charged plate? Explain your answer.
 - (b) A neutron travelling through the parallel plates is not attracted to either plate. Why?

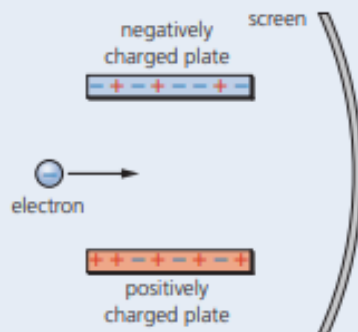


Figure 7

13. A student rubs a wooden stick with a cloth of unknown material and then brings the wooden stick near a suspended neutral pith ball. The pith ball does not respond.
 - (a) What is the charge on the wooden stick?
 - (b) If the material was one of the materials listed in the electrostatic series on page 276, which would it most likely be? Explain your answer.
14. If quartz is rubbed with a rubber cloth, the quartz becomes positively charged. Explain how the quartz becomes charged in terms of electron movement.