

Lesson Outline**LESSON 1*****Electric Charge and Electric Forces*****A. Electric Charges**

1. Atoms are made of protons, neutrons, and _____.
 - a. Protons and _____ make up the nucleus of an atom.
 - b. _____ move around the nucleus.
2. There are two types of electric charge—_____ and negative.
 - a. A(n) _____ has positive charge. A(n) _____ has negative charge.
 - b. The amount of _____ charge of a proton equals the amount of _____ charge of an electron.
3. An atom is electrically _____ when it has equal numbers of _____ and electrons.
4. Electrically neutral objects do not attract or _____ one another.
5. Objects can become charged when _____ move from one object to another.
 - a. A(n) _____ is an unbalanced electric charge on an object.
 - b. An object that gains electrons has a(n) _____ charge.
 - c. An object that loses electrons has a(n) _____ charge.

B. Electric Forces

1. A(n) _____ surrounds every charged object.
 - a. An electric field applies a(n) _____ to other charged objects.
 - b. When two charged objects have the same type of charge, the objects _____ each other. When two charged objects have different types of charge, the objects _____ each other.
2. The strength of an electric force between charged objects depends on the amount of _____ on each object and the distance between them.
 - a. If the distance between two charged objects stays constant, then electric force _____ as the total amount of charge of the two objects increases.

Lesson Outline continued

- b.** If the amount of charge on two objects stays constant, then electric force _____ as the objects move closer together.

C. Transferring Electrons

- 1.** If electrons cannot easily move through a material, then the material is a(n) _____.
- 2.** If electrons easily move through a material, then the material is a(n) _____.
- 3.** Electrons can transfer between objects by contact, _____, or conduction.
 - a.** When objects touch each other, charge can be transferred by _____.
 - b.** When charge is transferred by _____, an object causes two objects that are not _____ to become charged.
 - c.** An object is _____ when electrons are concentrated at one end of the object.
 - d.** When conductors with _____ charge touch, electrons flow from the object that has a greater negative charge to the object that has less negative charge in the process of _____.

D. Electric Discharge

- 1.** A(n) _____ is the loss of an unbalanced electric charge.
- 2.** Electric discharges can occur _____, such as when you brush your hair, or they can occur _____, such as when lightning strikes.
- 3.** A lightning rod is _____, which means it provides a path for electric charges to flow safely into the ground.