Name _____ Date _____ Class _____

Lesson Outline

LESSON 1

Electric Charge and Electric Forces

A. Electric Charges

1. Atoms are made of protons, neutrons, and **Electrons**.

a. Protons and **Neutrons** make up the nucleus of an atom.

b. **Electrons** move around the nucleus.

2. There are two types of electric charge—**Positive** and negative.

a. A(n) **Proton** has positive charge. A(n) **Electron** has negative charge.

b. The amount of **Positive** charge of a proton equals the amount of **Negative** charge of an electron.

3. An atom is electrically **Neutral** when it has equal numbers of **Proto** and electrons.

4. Electrically neutral objects do not attract or **Repel** one another.

5. Objects can become charged when **Electrons** move from one object to another.

a. A(n) **Static** is an unbalanced electric charge on an object.

b. An object that gains electrons has a(n) **Negative** charge.

c. An object that loses electrons has a(n) **Positiv** charge.

B. Electric Forces

1. A(n) **Electric Field** surrounds every charged object.

a. An electric field applies a(n) **Electric Force** to other charged objects.

b. When two charged objects have the same type of charge, the objects **Repel** each other. When two charged objects have different types of charge, the objects **Attract** each other.

2. The strength of an electric force between charged objects depends on the amount of **Charge** on each object and the distance between them.

a. If the distance between two charged objects stays constant, then electric force **Increase** 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 _____Increase_____ as the objects move closer together.

C. Transferring Electrons

1. If electrons cannot easily move through a material, then the material is a(n) _____Insulator_____.

2. If electrons easily move through a material, then the material is a(n) _____Conductor_____.

3. Electrons can transfer between objects by contact, _____Induction_____, or conduction.

a. When objects touch each other, charge can be transferred by _____Contact_____.

b. When charge is transferred by _____Induction_____, an object causes two objects that are not _____Conductor_____ to become charged.

c. An object is _____Polarize_____ when electrons are concentrated at one end of the object.

d. When conductors with _____Unequa_____ 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 _____Conductio_____.

D. Electric Discharge

1. A(n) _____Electrical Discharge_____ is the loss of an unbalanced electric charge.

2. Electric discharges can occur _____Slowly_____, such as when you brush your hair, or they can occur _____Quickly_____, such as when lightning strikes.

3. A lightning rod is _____Grounded_____, which means it provides a path for electric charges to flow safely into the ground.