

ELECTROSTATICS

Learning Targets

14.1

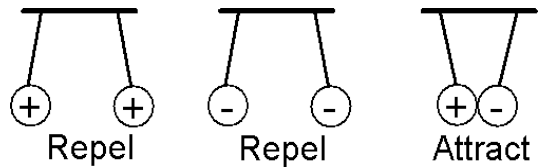
I can describe, interpret, and solve problems involving electric charge.

ELECTRIC CHARGE

In this chapter, you will investigate **electrostatics**, the study of electric charges that can be collected and held in one place.

Charged Objects

There are two kinds of electric charge, **positive** and **negative**. Interactions of these charges explain the attraction and repulsion that you observed in the aluminum can interactive.



Charged Objects

Principle of Conservation of Charge

Electrons are neither created nor destroyed but are simply transferred from one material to another. This principle is known as **conservation of charge**.

In every event, whether large-scale or at the atomic and nuclear level, the principle of conservation of charge applies.

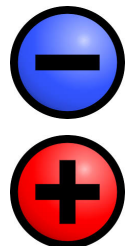
Conservation of charge is another of the physics conservation principles. Recall, from previous chapters, conservation of momentum and conservation of energy.



Charged Objects

Objects can be charged by the transfer of electrons.

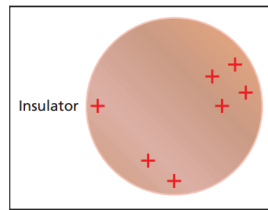
- An area with excess electrons has a net negative charge.
- An area with a deficit of electrons has a net positive charge.



Charged Objects

A material through which a charge will not move easily is called an electric **insulator**.

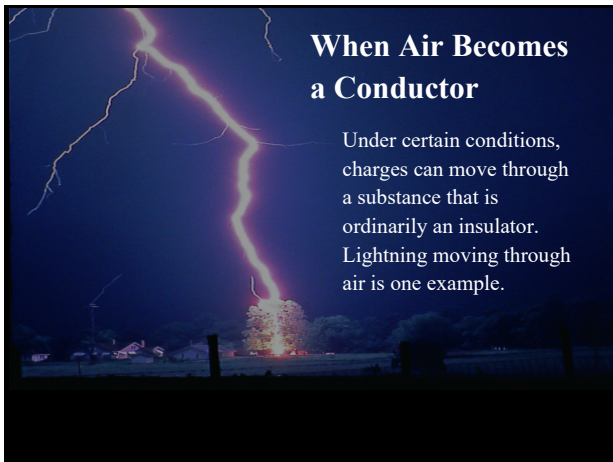
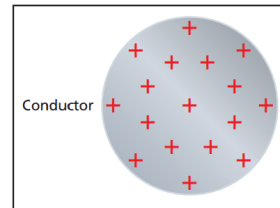
Charges added to one part of an insulator remain on that part. Insulators include glass, dry wood, plastics, and dry air.



Charged Objects

A material that allows charges to move about easily is called an electric **conductor**.

Charges added to a conductor quickly spread over the surface of the object. In general, examples of conductors include graphite, metals, and matter in the plasma state.



When Air Becomes a Conductor

Under certain conditions, charges can move through a substance that is ordinarily an insulator. Lightning moving through air is one example.

practice.
Problems (1-4)