Class Starters & Enders

Making the Most of Instructional Time
Five Minute Lessons

Class Starters and Enders help utilize the last minutes of class when a lesson ends but there is not enough time to start another, or for an interest approach at the beginning of class. Mini-lessons correlate to GPS in the programs areas below.

It's Electric!

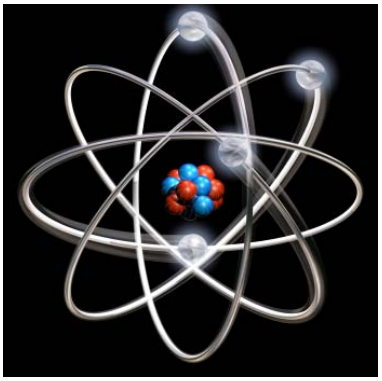
Program Areas: Engineering, Construction, Transportation, Electronics, Energy Systems, and Agricultural Mechanics

Instructions: Read the material and make notes of important points, answer questions, and be ready to discuss this topic.

Have you ever watched an intense lightning storm and wondered where it came from and how it was made? This phenomenon, along with many others, is due to the flow of **electrons**. Electrons are negatively charged subatomic particles that orbit around the nucleus of an atom, which is filled with protons (positively charged) and neutrons (neutral).

Electricity is the general term that applies to this flow of negatively charged particles. You may be wondering how the electrons flow. This process occurs when two atoms come into close contact with each other and the electrons "jump" from one atom to the other. When movement of electrons across atoms occurs in a one-directional flow, we call this an electric current.

Objects are classified according to how easily electrons are able to move through them. **Conductors** are substances that allow electric charges to move freely. These electrons are called **free electrons** because they can move from atom to atom without a problem. Most metals are excellent conductors. **Insulators** are made up of atoms whose electrons are tightly bound to the nucleus. Wood, plastic, and glass are some examples of insulators. Finally, some materials can be either conductive or insulating depending on their temperature; these are called semiconductors.



A device that produces an electrical current is called a generator. Generators force magnets to move past one another, which produces an electrical current.

A battery's positive and negative terminals have an electric potential between them; the negative terminal is electron-deficient and the positive terminal is electron-abundant. This electric potential causes electrons to flow from the positive to the negative terminal. If you slide your feet on a rug and shock a doorknob, this is because electrons have been transferred between you and the carpet, resulting in an electrical potential. This unchanging electrical potential is called **static electricity**. Two objects not in electron **equilibrium** create the electric shock that is experienced.

Despite the growing importance and reliance people put on electricity, we take it for granted. The flipping of a switch and pushing of a button are second nature to us and we never stop to think of the extensive technology used to generate that electricity.

Review Questions

1. What invention supplies most of the world with electricity?
2. T F. Two objects in electron equilibrium create static electricity.
3. T F. An object in which electrons move from one atom to another easily is called a conductor.
4. How does a battery cause electrons to flow in one direction?

Language Connection

Define the following terms:

electrons	equilibrium
electricity	free electrons
static electricity	conductors
insulators	semiconductors

Science Connection

Research and write a one page summary on a person that made a contribution to the discovery and use of electricity.

Georgia CTAE Resource Network - Written by Morgan Blacklock and Frank B. Flanders, Ed.D.