**ELECTRIC ENERGY** p.F68-F73

1. Electric Charges
   1. Electric energy is produced by the movement of electrons.
   2. Electrons have a negative change and protons have a positive charge
   3. The two types of particles attract each other.
   4. When an object gains or loses electrons it has an electric charge.
   5. An object that has gained electrons has a negative charge.
   6. An object that has lost electrons has a positive electric charge.
2. Electric Force
   1. If an object has a charge, it attracts objects with the opposite charge.
   2. Unlike charges repel each other
   3. This attraction or repulsion is called electric force. Electric force depends on distance
   4. Charged objects have potential electric energy. This is sometimes called static electricity, because the electron aren’t moving.
   5. If charges on the objects are the same, the objects repel each other. If the charges are opposite, the object are drawn together. If the objects touch or come very close to each other, electrons may flow from one object to the other.
   6. Electrons flow from negatively charged objects to positively charged objects.
   7. The flow of electrons is called electric current.
3. Electric Current
   1. Electric current is a low of electrons
   2. A lightning bolt is a brief but strong electric current
   3. To light a light bulb a continuous electric current must be produced. This requires a consistent electric force, so a source of electrons is needed. A dry cell, a battery, or a generator can be the source of electrons.
   4. Opposite charges build up on the terminals of a battery. Electron are attracted from one terminal to the other. Connecting the two terminal to the other. Connecting the two terminals allows an electric current to flow between them.
   5. Material that conducts electrons easily is called a conductor.
4. Electric Circuits
   1. A conductor is used in the wire that makes an electric circuit.
   2. An electric circuit is any path along which electrons can flow. Copper and aluminum are often used as conductors. Metals are good conductors of electric current because their atoms don’t hold electrons tightly.
   3. A conductor in a circuit is wrapped with a material called an insulator. An insulator is a material that doesn’t carry electrons. Rubber, plastic, glass, and air are good insulators. They resist the flow of electrons through them.
   4. Insulation keeps wires from touching each other and completing an electrical circuit before the electrons can reach a device.
   5. Resistors are materials that resist electric current

E. Magnets and Electricity

1. Magnets are used to generate, or produce, electricity. Spinning a coil of wire inside a magnetic field produces an electric force between the end of the coil. A compass placed next to a wire carrying an electric current will point to the wire.
2. Electromagnet – A bar magnet is always magnetized, while a coil wrapped around an iron bar is a magnet only when electric current flows through the coil.