Energy Transformation and Electrical Circuits

What is Energy?

• ________________ can mean lots of things. It’s everywhere!

• In physics, ________________ refers to the ability to do ________________ (and usually has something to do with movement or action).

• ________________ is anything that can make matter ________________ or ________________.

• ________________ comes in a number of forms including:
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Energy ________________

• The Law of ________________ of Energy states that energy ________________ be created or ________________ in a system. Instead, it must be ________________, or transformed, into another type of energy.

• Energy transformation is when energy is ________________ from one form to another

• Example:

Electric Circuits

• ________________ is the presence or movement of electrons, which are tiny, negatively charged particles that orbit an atom’s nucleus. Electricity is what we get when electrons move from one place to another.

• Energy can be transferred from one system to another when two objects push or pull on each other over a distance. In the case of electricity, electrons are pushed and pulled through a circuit.

• A ________________ is a push or a pull. There are many types of forces. The pushing and pulling of moving electrons is an ________________ ________________.

• ________________ is naturally present in lightning and static electricity, but the flow of the electrons in lightning and static electricity are not controlled or steady.
In order for electricity to be useful in our homes and devices, there needs to be a steady flow of electrons called a ________________.

There also needs to be a complete ___________________ or a complete loop through which the electrical current can pass.

In a complete circuit, energy starts at a power source (for example a battery), moves through a ___________________ (for example, a metal wire), passes through a load (a device that uses electricity such as a light bulb or toaster) and returns back to the power source.

It starts out in one place, travels around the circuit, and ends up back at the place where it originated. The electrons are pushed and pulled through the circuit.

**Batteries and Circuits**

- Batteries are devices that use “______________________________” to produce electricity. They work by changing stored chemical energy into electrical energy.
- A __________________ reaction inside a battery creates electrons. These electrons are stored in the negative terminal (-) of the battery. When a battery is part of a complete circuit, the negative terminal pushes the electrons out.
- The electrons travel from the negative terminal, through the circuit to the positive terminal (+). The positive side of the battery pulls the electrons in.
- Batteries create an ___________________ __________________by pushing and pulling electrons through a complete circuit.

**Generating Electricity**

- Power plants use generators to produce electricity. The electricity produced through these generators are secondary energy sources.
  - ___________________ __________________ sources are found in nature and have not been subjected to any conversion or transformation process such as sunlight, wood, oil, coal and natural gas.
  - ___________________ __________________ sources have been transformed from another source.
  - To produce electricity through a _____________________, a heat source is needed to create the conditions in which electrical currents form. This heat can come from a variety of different primary energy sources including coal, hydro power, wind power, nuclear and solar energy
  - Water, wind and solar are some sources of ___________________ __________________ meaning they do not ______________________ the environment.