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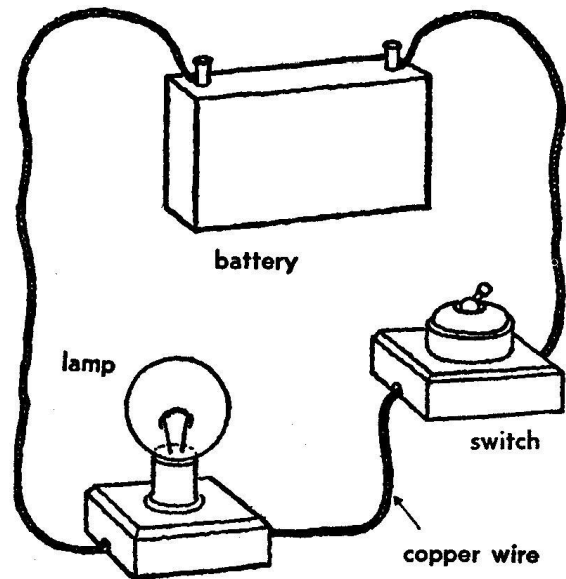
Electricity and Me!

Key Words

battery	bulb	circuit
complete circuit	conductor	device
electric current	electricity	electrons
energy-user	incomplete circuit	power source
switch	wire	

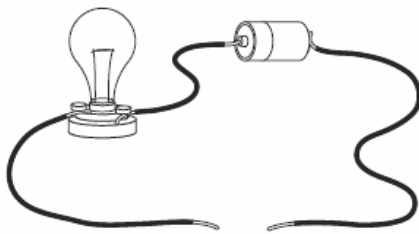
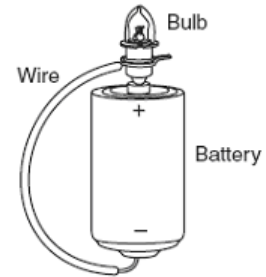
You use **electricity** every day—when you plug in a lamp, talk on a cell phone, or turn on the television. Electricity powers our world. Electrical energy, or electricity, is the energy of moving electric charges called **electrons**. These electrical charges move through pathways called **circuits**.

A flow of electricity is called an **electric current**. An electrical circuit is the path through which the electric current flows. The diagram to the right shows a simple circuit. A **complete circuit** like the one pictured has three main parts: a **power source**, a **conductor**, and a **device** that uses the electricity to produce magnetic effects, light, heat, and/or sound. A circuit may also have a **switch**, which is used to open and close the circuit. A power source is anything that supplies the electricity. When you plug an electrical device into a wall socket, you are plugging the device into an electrical source. A **battery** is also an electrical power source. There are many **energy-users** that use electricity in order to function. Some examples of electrical devices are lamps, computers, toasters, and IPOD™s. The conductor in a complete circuit carries the current from the power source to the electrical device and back again. Conductors are usually made of metals such as



copper. In the diagram, copper **wires** are used to move the electricity from the power source to the light **bulb**. The switch in a circuit opens and closes the circuit. In other words, the switch can start and stop the flow of electricity in a circuit.

The diagram to the right shows a **complete circuit**. This is also called a closed circuit. It is a complete path for the flow of electricity. Electricity moves from the battery through the wire to the bulb. The bulb lights up because electrical current is moving through it. Electricity only moves in a complete, or closed, circuit.



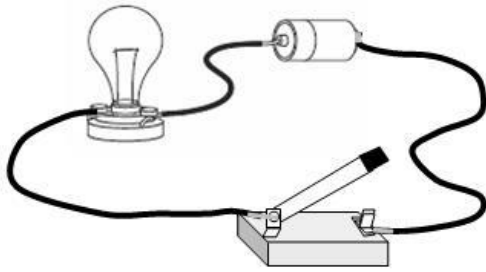
The diagram to the left shows an **incomplete circuit**, sometimes called an open circuit. It shows an incomplete path for the flow of electricity. An open circuit has one or more breaks in it. Since the circuit has a break, electricity cannot move through it.

To be useful, electrical energy must be changed into other forms of energy, such as light, heat, sound, and mechanical energy. These changes take place in a complete circuit. When you switch on a light, electricity flows through a closed circuit to the light bulb. The electricity causes a wire or a type of gas inside the bulb to heat up and glow, giving off light. The bulb also gives off thermal energy, or heat.

Some devices, such as toasters and hair dryers, use electricity to produce thermal energy. When electricity passes through wires made of certain metals, the wires get very hot and glow. The heating element inside a toaster is made of loops of this kind of wire. When you start the toaster, electricity passes through the wire. The wire gives off enough heat to toast the bread. A hair dryer also has coils of wire that heat air passing over them. A hair dryer also has a small fan which uses mechanical energy to push air out the end. When the fan spins, electrical energy is changed into mechanical energy.



1. Look at the diagram of the circuit below. This circuit—



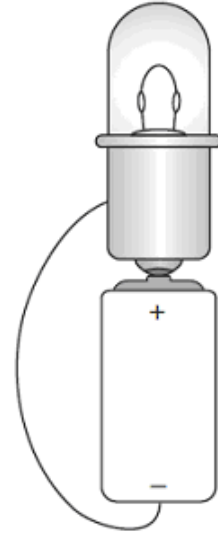
- A is closed
- B has no power source
- C is open
- D contains no conductors

2. Which of the following can be used as a power source to supply electricity to an electrical circuit?

- A A wire
- B A battery
- C A switch
- D A light bulb

3. Students are designing an electrical circuit that produces sound. Which of the following could be used to conduct electricity in the circuit?

- A Metal foil strip
- B A small glass tube
- C A rubber band
- D A drinking straw



4. What two forms of energy are produced by the light bulb in the complete circuit pictured above?

_____ energy
_____ energy

5. What is the complete path through which electricity flows, producing light, heat, and/or sound?

6. Name the parts of the circuit shown above.

Energy source: _____

Conductor from battery to bulb: _____

Uses electricity to produce light: _____

Here's a Switch

Materials:

Battery

Light bulb holder

Masking tape

Wires, 3

Light bulb

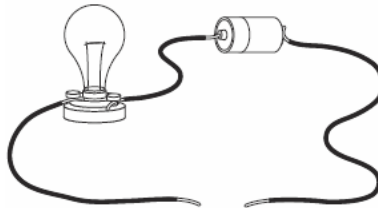
Large paper clip

Question: How does a switch stop and start the flow of electricity in a circuit?

Hypothesis: _____

Procedures:

- Make sure the bulb is placed securely in the bulb holder.
- Attach a wire to each clip in the bulb holder.
- Tape the free end of one wire from the bulb holder to the negative end of the battery.
- Tape one end of the third piece of wire to the positive end of the battery.
- Your incomplete circuit should look like the one below.



Fill in the graphic below with by placing the word or definition that is missing.

Electric Energy	A form of energy created by moving electric charges
Battery	
	a complete path for the flow of electricity
wire	
	Used to open and close a circuit
Light bulb	
	an incomplete path for the flow of electricity.
Examples of Insulators	