What are circuits?

Before in Static Electricity, we learned that conductors are things that like to move charges: electrons. Also, in Marshmallow Catapults, we learned that moving objects have kinetic energy. So in a way, electricity is a form of energy. Electrical engineers have used these ideas to build circuits. Circuits are closed loops that are always moving charges along conductors to power many things from lamps to computers.

**Question 1:** Listen to the SCouts talk about the different parts of a circuit. Label the following diagram using the terms on the back page.
1. The **energy source**, also called a **power supply**, is normally a battery that stores electrical energy as chemicals inside.

2. The **load** is an object that has **resistance** which uses up the energy from the energy source. (Read below.)

3. The **conductor** is some material where moving electrons travel along from the battery to the load. Usually, the conductor is a metal wire.

**Resistance**

Electrical **resistance** is like **friction to moving electrons**. We already know that electrons move easily through conductors, so **conductors have low resistance**. On the other hand, objects that have **high resistance** are called **insulators** because they **block** the flow of **electrons**. The resistance of an object depends not only on what it is made of but also its shape. A load’s **resistance** is what **takes away energy** from moving electrons, kind of like how we use the friction of our hands to make heat on a cold day.

**Question 2:** In our circuit, we use a special Play-doh as the conductor. Name another material that is a good **conductor**. (Hint: What are the tails of the LEDs made of?)

**Question 3:** Circle the correct answer.

Electrons move more easily through things with ( **high / low** ) resistance.

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**Bonus Question: Think like an engineer!**

Ever notice why batteries have + and - sides? This is because electrons **flow out from the ( + / - ) side and flow back in the ( + / - ) side.**