Squishy Circuits – USC Science Outreach Spring 2015

Materials	Amount per Trial
Circuit Board (Premade)	1
Bag of Materials	1
LED Lights	2
Conducting Playdoh	1

Bag of Materials may include: piece of wool, 3 Mylar strands, paper folder strand, cardboard strand, plastic spoon, metal utensil, nickel, penny, tin foil, pencils, wire.

Discussion (~10~15 minutes):

What is a circuit?

When you think of a circuit, think of a circle!

- **Closed loop** – The circuit is complete! A closed loop allows electricity to flow to the battery.
- **Open loop** – The circuit is broken. There is no way for electricity to flow to the battery.

Have you ever ridden on a rollercoaster?

What would happen if a section of the track were missing?

A roller coaster only works if the track is "closed" in a giant loop. If any part of the track is missing, the roller coaster cars will never make it to the end. Like these tracks, **circuits** need to be closed.

What is a circuit?

A **circuit** is a closed loop around which electricity flows. Extending the rollercoaster analogy, if the tracks represent the circuit, then the rollercoaster cars represent the **electricity.**

What is the difference between a conductor and insulator?

- **Conductor** – An object that allows electricity to flow. They have *low resistance.*
- **Insulators** – Blocks electricity from flowing. They have *high resistance*.

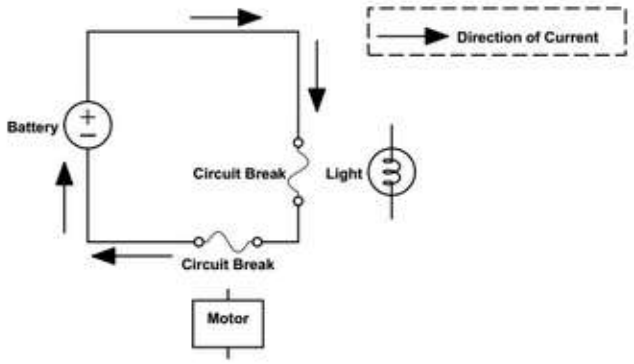
What makes a circuit?

Energy Source: This is the battery that supplies power to the circuit.

Load: Something that draws power from the battery, like a light bulb or a motor!

Wire: This is the "track" that connects the battery to the load and allows electricity to flow around the circuit. This can be a metal rod, foil, or any other conductor.

Draw this diagram on the board and label the different parts of a circuit.



Procedure: (20~30 minutes):

Part 1: Conductors and Insulators

Materials: Bag of Materials, Circuit board

Scouts should spread out among the tables. As students test different materials, help them identify the materials as either a conductor or an insulator. Have them explain why, does the material "close the loop"?

1. Pass out the circuit boards to groups of three
2. Hand out various materials
3. Ask the kids to fill in the first broken circuit
4. Ask the kids to fill in the second broken circuit
5. Rank which items let the motor spin the
6. Discuss the results
7. If time, use wires or other conductors in your and explain how it works, what is a circuit, and what each component does

Part 2: Challenge Round

Materials: Playdoh, LED Lights

In their groups, students will try to complete each of the challenges. Groups should work somewhat independently, with little help from Scouts. If they complete one challenge, have them explain why their setup may have worked.

1. Make the LED light up in a circuit.
2. Make more than one LED light up.
3. What is another way you can make the LED light up?