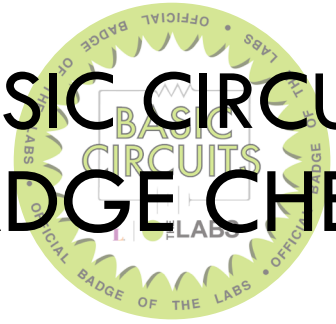
BASIC CIRCUITS BADGE CHECK



Name: _____

Mentor: _____

Date: _____

PREREQUISITE BADGES: NONE

TERMS AND SKILLS YOU SHOULD KNOW:

Electricity	Circuit	Voltage	Connection	Battery
Positive/Anode	Negative/Cathode	Current	Open Circuit	Short Circuit
Break	Conductivity	Ground	Leads	Conductor
Switch				

HELPFUL RESOURCES:

SparkFun tutorials:

What Is Electricity?: https://learn.sparkfun.com/tutorials/what-is-electricity
What Is A Circuit?: https://learn.sparkfun.com/tutorials/what-is-a-circuit
Voltage, Current, Resistance and Ohm's Law: https://learn.sparkfun.com/tutorials/voltage-current-resistance-and-ohms-law

Lynda.com videos:

Understanding Power Flow: http://www.lynda.com/Arduino-tutorials/Understanding-power-flow/162273/170789-4.html
Reading Circuit Diagrams: http://www.lynda.com/Arduino-tutorials/Reading-circuit-diagrams/162273/170790-4.html

YouTube video: *How to Draw Simple Electric Circuits Lesson:* https://www.youtube.com/watch?v=52JoONLGI2s

EXPLANATION OF SKILLS:

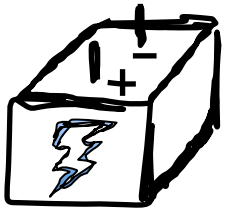
The Basic Circuits badge certifies that the earner understands the basics of how an electrical circuit works. The earner has demonstrated an ability to design and create a circuit using conductive materials, a source and a load.

BADGE CHECK GUIDELINES:

- You are allowed to use the Badge Resources and other print or online tools if you get stuck during your badge check, but no one-on-one help from others
- You must complete all questions and tasks associated with the badge you're earning
- You must present the evidence of your work to a teen mentor for verification and sign-off
- If you don't pass the badge check, you can take it again in a week

KNOWLEDGE CHECK:

1. Here's a battery and a light bulb – draw in wire conductor to connect the two devices in a way that will energize the bulb:



2. Name three materials you know to be conductive.
3. Name two reasons a circuit might not work even when it looks like it's connected properly.
4. With just a light, a battery, and some wires, how might you test if a material is conductive? (Feel free to explain using words or a drawing)
5. What's the difference between a Short Circuit and an Open Circuit? Would you consider one to be worse than the other? Why?

SKILLS CHECK:

For this skills check, you must create a functioning circuit. Follow these steps:

1. **Draw a schematic** of what the circuit will look like.
2. Once you have a schematic, **collect the appropriate materials needed**. Be sure these materials include a power source, a load such as an LED, a resistor (if necessary) and a conductor to connect them.
3. **Create your circuit** using your materials – if your circuit isn't working, troubleshoot reasons for this and see if you can fix the issue.

UPON COMPLETION:

- Submit sheet with **knowledge check** answers to mentor for review
- Present final **circuit** product to mentor for review – do not submit a work-in-progress, you will not qualify for a badge
- If a mentor cannot review your badge check immediately, schedule a time for you and a mentor to go over your badge check

SKILL BADGE CHECK APPROVAL:

_____ _____

EARNER'S SIGNATURE MENTOR'S SIGNATURE

THIS BADGE CAN BE USED TO EARN:
2nd TIER MAKER BADGE