

## 27.4: Procedures

### Warnings

- Exposed ends of wires can burn you.
- Wires will become hot if a short circuit is created.

You will construct a variety of circuits.

### Simple Flashlight

1. **Your first task is to construct a simple circuit using a single wire, a single battery, and a single light bulb (no socket). This circuit may be used to test whether light bulbs are broken as you progress through the lab. You must have this circuit checked by your instructor before you continue.**
2. Draw two data tables in which to record working/not working results and brightness results for your circuits. **Do not fill in data until you have read the instructions for obtaining that data.**

Table 27.4.1: Electric Circuit Data

	Working	Not Working
2 Bulb Series, 1 Bulb Removed		
2 Bulb Parallel, 1 Bulb Removed		

Table 27.4.2: Brightness Data

	Brightness Decreased	Brightness Unchanged
3 Bulb Series		
3 Bulb Parallel		

3. Tape two batteries together, making sure the batteries are “stacked” similar to how they would be placed in a regular flashlight.



Figure 27.4.1

### Series Circuit

4. **You will need to have this circuit checked by your instructor once it is working.** Construct a series circuit using 2 batteries, 2 bulbs, 2 sockets, and as many pieces of electrical leads as you need. If the bulbs do not light, test each light bulb with a battery and a wire. Once you have a working circuit have it checked by your instructor. Then unscrew one bulb from a socket. Record whether the series circuit is working or not working after the bulb is removed.
5. Add a 3rd bulb with a socket to your series circuit. Record whether the brightness decreased or was unchanged when the 3rd bulb was added to your series circuit. Detach the batteries and set the taped batteries and series circuit aside; do not disassemble your series wiring.

### Parallel Circuit

6. Tape the other two batteries together.
7. **You will need to have this circuit checked by your instructor once it is working.** Construct a parallel circuit using 2 batteries, 2 bulbs, 2 sockets, and as many pieces of electrical leads as you need. If any of the bulbs do not light, test them with a

battery and a wire. Once you have a working circuit, have it checked by your instructor. Then a un-screw one bulb from a socket. Record whether the parallel circuit is working or not working after the bulb is removed.

8. Add a 3rd bulb with a socket to your parallel circuit. Record whether the brightness decreased or was unchanged when the 3rd bulb was added to your parallel circuit. Detach the batteries and set the taped batteries and parallel circuit aside; do not disassemble your parallel wiring.

### Comparing Series & Parallel

9. Re-attach the batteries to each of your circuits, series and parallel. Once you have both circuits operating, compare the overall brightness of the bulbs in each. Note that some bulbs may be brighter than others as a function of age. Record which type of circuit, in general, has the brightest bulbs.
10. Construct a combination circuit such that part of your circuit is wired in series and part of your circuit is wired in parallel. Sketch this circuit and indicate where you have series connections and where you have parallel connections. Record any differences in brightness you observe.

### Contributors and Attributions

- Template:ContribCCPhySc101L

---

27.4: Procedures is shared under a [CC BY](#) license and was authored, remixed, and/or curated by LibreTexts.