

NAME: _____ DATE _____

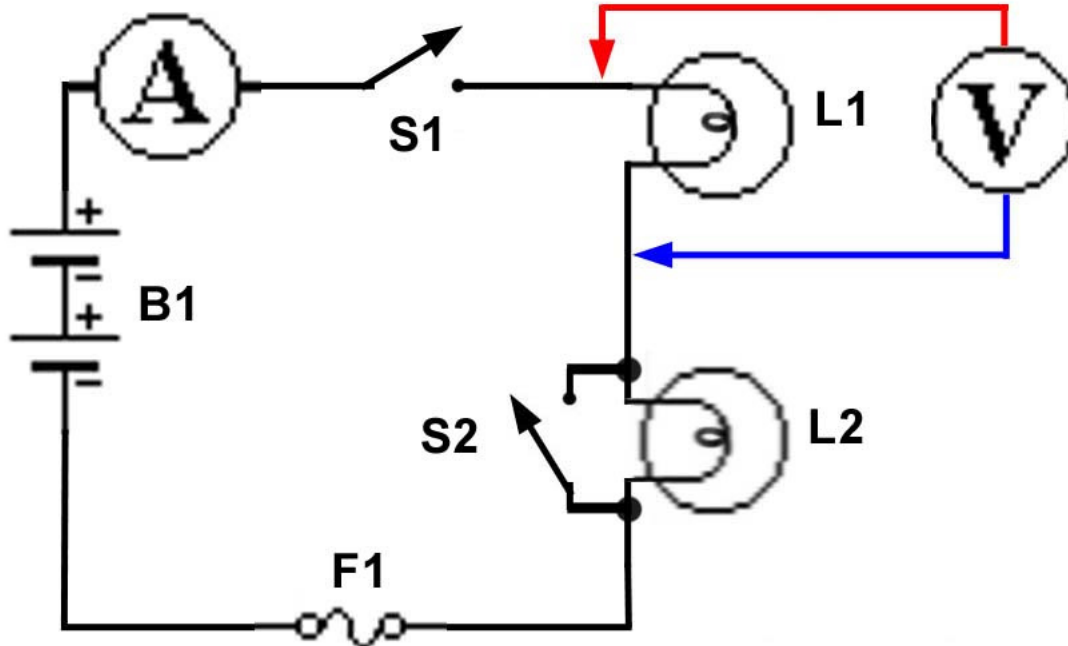


Figure-1: Battery Powered Lamp Circuit

- In **Figure-1**, the power source is 10 volts. S-1 and S-2 are closed. The lamps, when cold, have a resistance of 3-ohms and when hot, a resistance of 9-ohms. Calculate the cold and hot current.

I_{cold} _____ I_{hot} _____

Power Formula 2

$$P = \frac{E^2}{R}$$

- How many watts does one lamp dissipate when cold?

P = _____

- How many watts does one lamp dissipate when hot?

P = _____

4. If the total current of one lamp, cold, should be 75% of a fuse's rating, what would the appropriate value be for the fuse in **Figure-1**.
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$$\frac{1}{R_{\text{tot}}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

parallel resistance

5. If a second lamp was added in parallel (draw the lamp with the appropriate switch and label L-3 and S-3), what is the total resistance (hot and cold)?
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6. If a second lamp was added in series (S-2 open), what is the total resistance (hot and cold)?
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7. Conventional Current Flow is ___ to ___ and Electron Flow is ___ to ___.

8. What is the voltage across L1 when:

- S-1 is open and S-2 is closed? _____
- S-1 and S-2 are closed? _____
- S-1 is closed and S-2 is open? _____

9. **True or false:** A bungee is more like a capacitor than a resistor? _____

10. **True or false:** A wire is closer to 1000 ohms than 10 ohms? _____

11. Create the graphic equivalent of Ohm's law -- $I=E/R$ -- using a resistor and a meter. Label both and then draw the symbol for the type of meter this graphic represents.