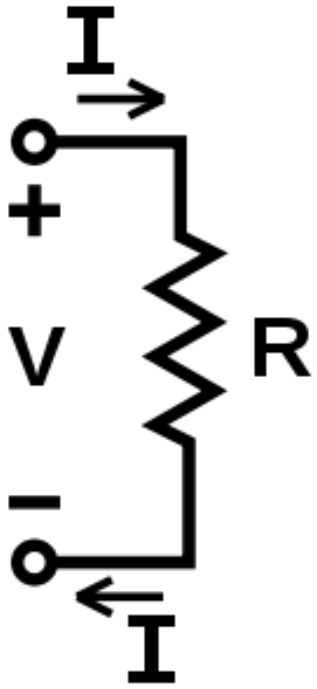
Ohm's Law

$$V = I \cdot R$$

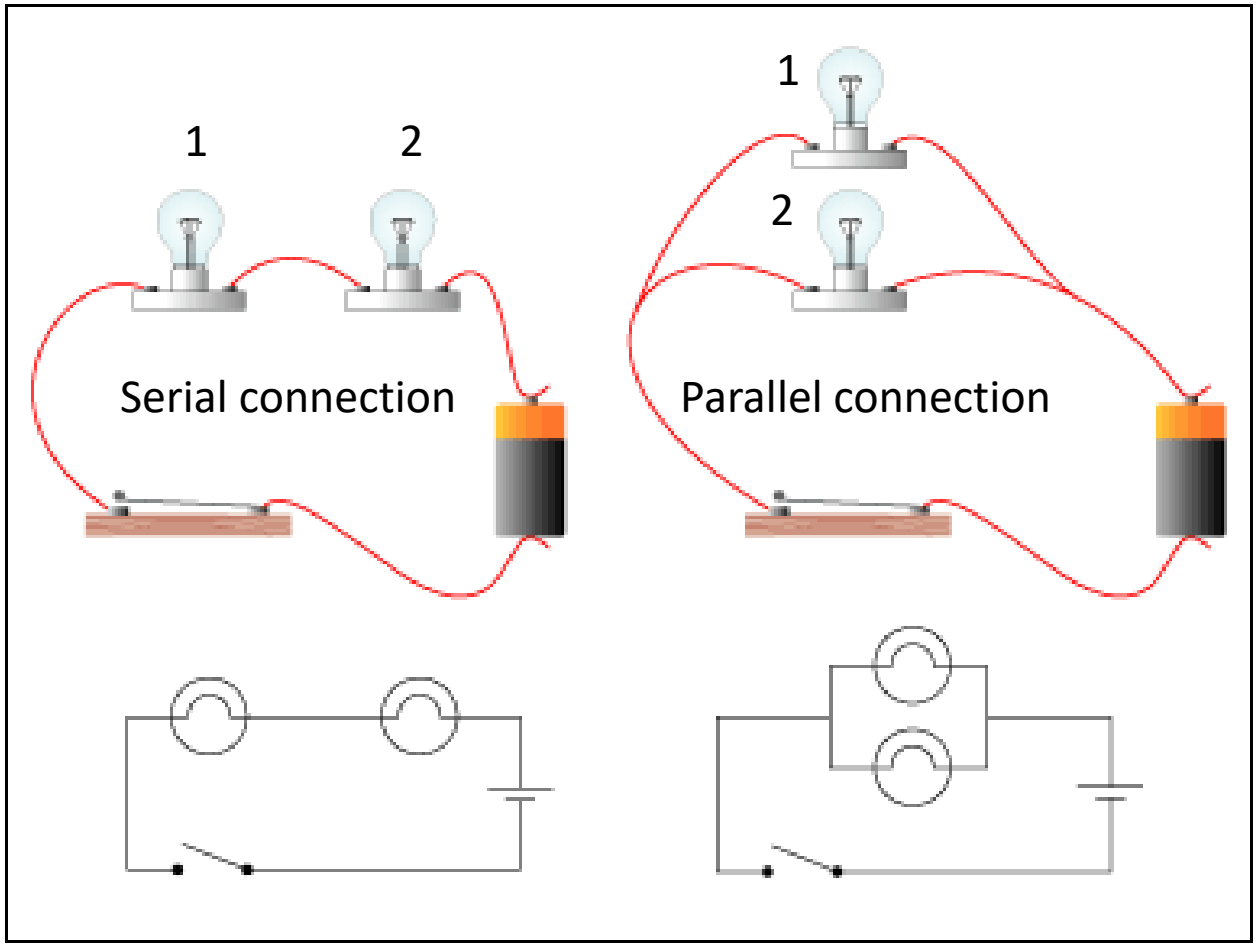


• **V** is **Voltage Drop**, the **Potential Difference** between two ends of a wire (or resistor, light bulb etc). Measured in **Volts [V]**

• **I** is **Electric Current,** the total charge flowing through the wire in 1 sec. Measured in **Amperes [A]** (Coulomb per second) **:** **1A=1C/s**

• **R** is **Resistance** of the wire. Measured in **Ohms [Ω]**. $1\Omega = 1\,V/A$

Serial and Parallel Circuits



Serial:

- Currents are the same: $I_1=I_2$
- Voltage is added: $V= V_1+V_2$

Parrallel:

- Currents are added: $I=I_1+I_2$
- Voltages are the same: $V_1=V_2$

Homework

Problem 1

An electric heater is made out of a piece of wire with resistance R= 10 Ω, plugged into a standard 110V outlet. Find the current through this wire, and the overall power of this heater (remember that Power=V*I).

Problem 2

Two resistors , 10 Ω and 20 Ω are connected to a 1.5V battery in parallel. Sketch the circuit, and find the total current flowing via the battery.
You want to replace these two resistors with a single one, so that the current stays the same. How large should be its resistance?