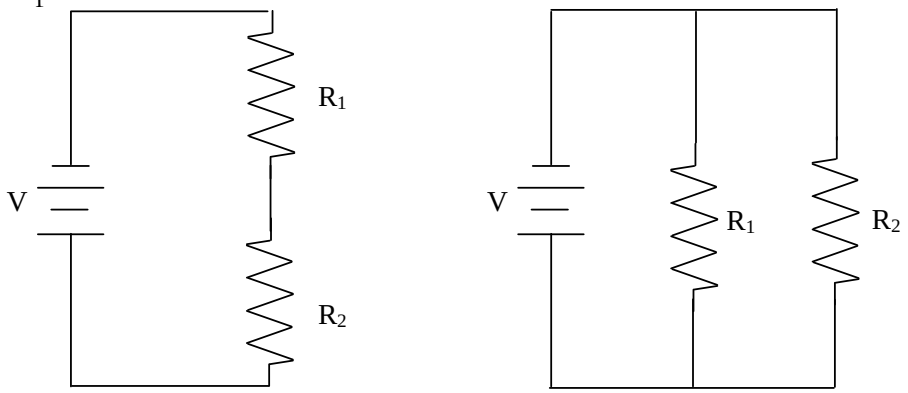
Circuits Activity: Series and Parallel (Pre-lab)

The simplest electrical circuit consists of a complete loop of conducting wire with a source of current and some "load". A load is any component that causes a reduction in the current, such as a resistor, light, or motor. If two of more loads exist in a circuit they may be arranged in two general fashions, series or parallel.



In a series arrangement the resistors are connected end-to-end, such that the charges moving in the loop must pass through all of the resistors. If the resistors are connected in parallel the charges have a "choice" as to which resistor they will pass through. Each charge can pass through only one of the resistors before returning to the voltage source.

Pre-Lab Questions:

1. Build a series and parallel circuit. Your instructor will check when done. Which one is called series? Parallel?

2. Judging by the bulb brightness, which circuit has the greater current?

3. Judging by the bulb brightness, which circuit has the greater resistance?

4. Without changing anything else, remove a bulb from each circuit. What happens to the other bulb?

5. Is the wiring in your house series or parallel? How do you know?

Circuits Activity: Series and Parallel

Build three series circuits with different resistors, and then build three parallel circuits. Complete the data table for each. Look for patterns.

Series #1:

	V	**I**	**R** (Ohm's law)
R_1			
R_2			
Total			

Series #2:

	V	**I**	**R** (Ohm's law)
R_1			
R_2			
Total			

Series #3:

	V	**I**	**R** (Ohm's law)
R_1			
R_2			
R_3			
Total			

Parallel #1:

	V	**I**	**R** (Ohm's law)
R_1			
R_2			
Total			

Parallel #2:

	V	**I**	**R** (Ohm's law)
R_1			
R_2			
Total			

Parallel #3:

	V	**I**	**R** (Ohm's law)
R_1			
R_2			
R_3			
Total			

Conclusion: Please write a response to this lab using the following questions as guidelines.

- What does an ammeter measure? How is an ammeter connected to a circuit?
- What does a voltmeter measure? How is a voltmeter connected to a circuit?
- When you measure the "voltage" of a battery, are you measuring a voltage boost or a voltage drop? How about a resistor?
- What patterns do you see in your data for series circuits?
- What patterns do you see in your data for parallel circuits?
- What is equivalent resistance? Which circuit has a great equivalent resistance?