

**Simulation Lab: Series and Parallel Circuits**

**Purpose:** To determine the relationship between voltage drop and current in both parallel and series circuits.

**Materials:** Online simulation -

[http://phet.colorado.edu/simulations/sims.php?sim=Circuit\\_Construction\\_Kit\\_DC\\_Only](http://phet.colorado.edu/simulations/sims.php?sim=Circuit_Construction_Kit_DC_Only)

**Part A: Series Circuits**

1. Create a circuit with a battery and one light bulb. Complete the table below.

Voltage (V)		Current (A)	
$V_1$		$I_1$	
$V_T$		$I_T$	

*Draw a circuit diagram.*

2. Create a circuit with a battery and two light bulbs connected in series. Complete the table below.

Voltage (V)		Current (A)	
$V_1$		$I_1$	
$V_2$		$I_2$	
$V_T$		$I_T$	

*Draw a circuit diagram.*

3. Create a circuit with a battery and three light bulbs connected in series. Complete the table below.

Voltage (V)		Current (A)	
$V_1$		$I_1$	
$V_2$		$I_2$	
$V_3$		$I_3$	
$V_T$		$I_T$	

*Draw a circuit diagram.*

Analysis:

1. What happened to the brightness of the bulbs as they were added in series?
2. If one light bulb were to go out, what would happen?
3. Summarize voltage in a series circuit.
4. Summarize current in a series circuit.

## Part B: Parallel Circuits

1. Create a circuit with a battery and two light bulbs connected in parallel. Complete the table below.

Voltage (V)		Current (A)	
$V_1$		$I_1$	
$V_2$		$I_2$	
$V_T$		$I_T$	

*Draw a circuit diagram.*

2. Create a circuit with a battery and three light bulbs connected in parallel. Complete the table below.

Voltage (V)		Current (A)	
$V_1$		$I_1$	
$V_2$		$I_2$	
$V_3$		$I_3$	
$V_T$		$I_T$	

*Draw a circuit diagram.*

Analysis:

1. What happened to the brightness of the bulbs as they were added in parallel?
2. If one light bulb were to go out, what would happen?
3. Summarize voltage in a parallel circuit.
4. Summarize current in a parallel circuit.