# IEEE's Hands on Practical Electronics (HOPE)

Week 1: Course Introduction, Safety, Soldering, Terminology

**Objective:**

Today you will be learning how to solder.

**Safety:**

If you are using soldering irons that get hot (not the ColdHeats), be careful not to burn yourself.

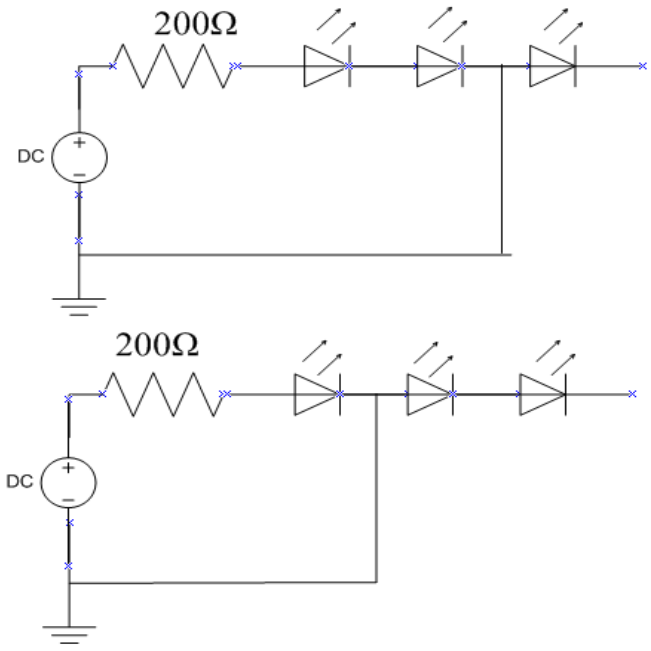
**Materials:**

1 board, approximately 2 in. x 2 in.
1 9V Battery
1 Battery Lead
1 200 Ω Resistor
3 LEDs

**Directions:**

1. Choose one side as the top
2. Insert the components from the top so all the leads stick out from the bottom
3. Solder together the resistors and LEDs. Cut off any extra leads to make it cleaner.
4. Touch the ends of the battery lead to the circuit manually (**Do not solder the battery to any part of the circuit!**)
5. Write your name on the circuit. We will use it for lab 2.

Complete this circuit:



**Questions:**

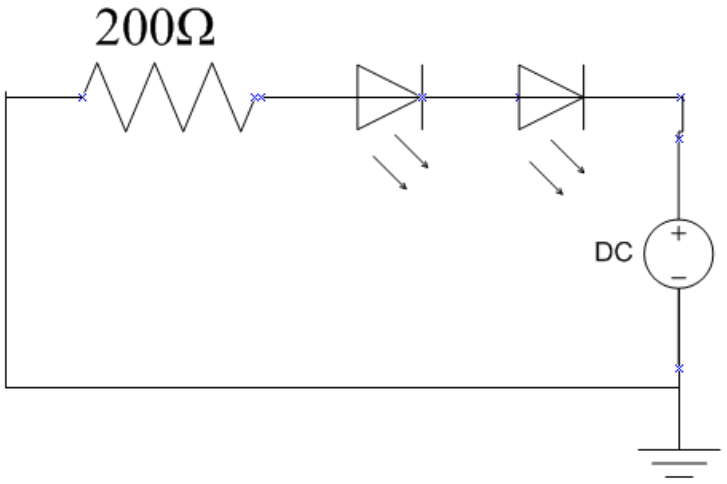
1. Why do the LEDs that are not connected in a loop with the battery fail to emit any light?

2. Do you notice a difference in brightness of the LEDs as you connect more of them in the loop with the battery?

3. How many LEDs can you add before none of them emit light? Why do you think this occurs?

**Part 2:**
Attach the battery to your circuit according to the following diagram.

4. What is different from Part 1?




5. Do the LEDs turn on?

6. Can you give a reason for this effect? (Hint: Think back to the warning on connecting LEDs)