Conceptual Physics Lab 08s: **LED Lab, Part II**

In part II of the LED Lab, you will investigate the material structure and composition of a LED.

**Procedure:**

1. Choose a LED from your basket of materials. Using an optical microscope, sketch a side view and top view of the LED. Describe the materials that comprise the components of the LED.
2. Using the optical microscope, focus in on the material within the LED. Use the microscope to validate the turn-on voltage for each LED that you obtained from Part I. Use a digital multimeter to record the voltage across the LED (as shown by Mr. Cook). Correct your values as necessary.
3. Begin working with your lab partner on the POGIL – Materials after you have put away your lab equipment.

**Summing Up:**

1. Did the optical microscope enhance your ability to more accurately determine the turn on voltage of each LED? Explain why or why not.
2. Did the digital voltmeter enhance your ability to more accurately determine the turn on voltage of each LED? Explain why or why not.
3. MACRO: Sketch a diagram which shows the path (and direction) that electrons flow in traveling between the power source and LED.
4. MICRO: Focusing on the LED, sketch a diagram which shows the path (and direction) that electrons flow in traveling from one leg of the LED to the other.
5. NANO: Focusing on the LED material, sketch a diagram which shows how you think electrons move within the semiconductor crystal. Label your diagram. [HINT: Refer to your POGIL – Semiconductor Materials]
6. Which LED produces light which is the highest in energy? Justify your response mathematically. [HINT: You will need your results from Part I for this, as well as ]
7. [**Critical Thinking**] How can LEDs produce different colors of visible electromagnetic radiation (light)? Explain.