Post Lab Questions:

1. On a single graph, plot the three voltage/current curves with the voltage on the x axis. On another graph, plot the output power of the panel at each voltage level. Use a spread sheet program (such as Excel) to plot the data, **hand drawn curves are unacceptable.**

   See attached graphs (attached 1)

2. Find the peak power point and fill factor for each curve.

   120V = 0.103W 100V = 0.0748W 80V = 0.0388W

   FF = 0.6999 FF = 0.6862 FF = 0.5071

3. Using your irradiance measurements and peak power points, calculate the maximum efficiency of your PV panel for each lighting level.

   $120V = \left(\frac{P_{max}}{Area}\right) / Irradiance = .0259$ 100V = .0255 80V = .0174

4. Plot the current of your solar cell versus the angle (in degrees with the angle on the x axis). On another graph, plot the current of the panel versus the cosine of your angle (in degrees with the angle on the x axis). Use a spread sheet program to plot the data, **hand drawn curves are unacceptable.** Describe the relationship shown by your graphs.

   The more indirect the light is, the less current is produced.

   (See attached graphs 4)

5. Plot the voltage/current curve of the fuel cell with the current on the x axis. On another graph, plot the output power of the fuel cell with current on the x axis. Use a spread sheet program (such as Excel) to plot the data, **hand drawn curves are unacceptable.**

6. Determine the efficiency of the fuel cell.

$$\eta = \frac{\text{Electrical Energy}}{\text{Energy Content of Hydrogen}} = \frac{V * I * t}{H_{OH2} * Vol_{H2}} = \_\_\_\_\_$$

H_{OH2} = Energy Density of Hydrogen = 11920 kJ/m^3

To get efficiency in percent, you will need to cancel units. Hint:

1 V*A*sec = 1 J 1 m^3 = 10^6 mL