Name _____ Date _____

A New Angle on PV Efficiency

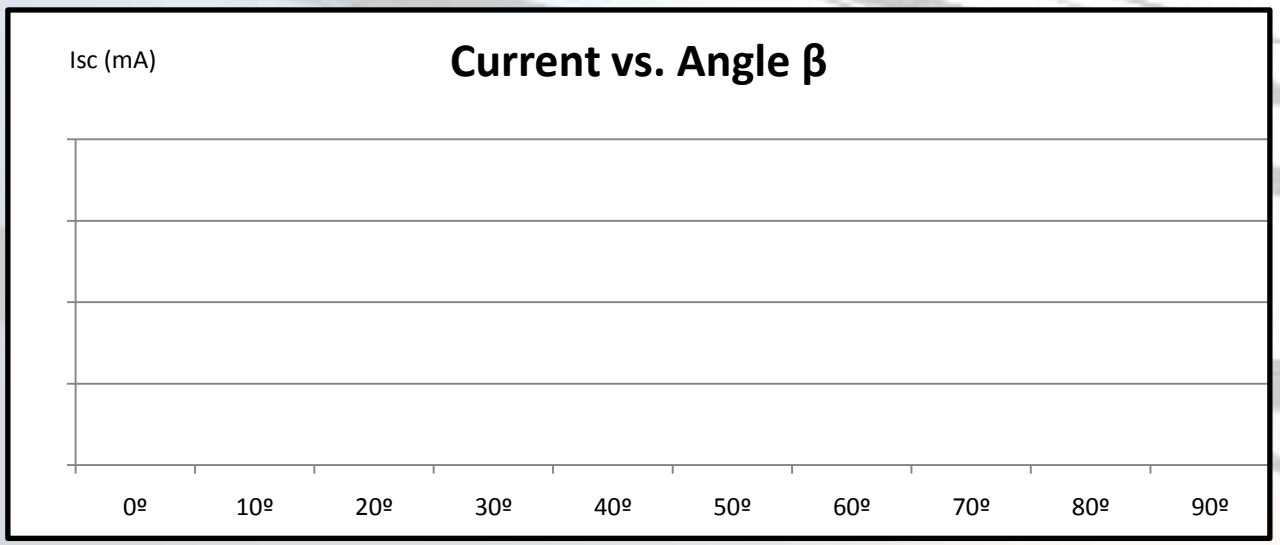
Investigation Worksheet

Experiment 1: Vary the Collector Slope Beta, β

Start with the PV panel flat (0º). Record the current produced with the multimeter every 10º. Record the measurements in the table. Be sure that your base does not move at any point during the experiment.

Solar angles:	θz=	γ=0º							
β	**0º**	**10º**	**20º**	**30º**	**40º**	**50º**	**60º**	**70º**	**80º**	**90º**
Isc (mA)										

Plot the current measured at each angle on the graph below. Draw a curve connecting the points.



Investigating Questions

1. At what angle did the PV panel create the highest current? Why?

2. What happens as a result of tilting the PV panel away from the sun?

3. If you were to build a home at this location, how would you design the roof to optimize PV efficiency, with minimal installation equipment?

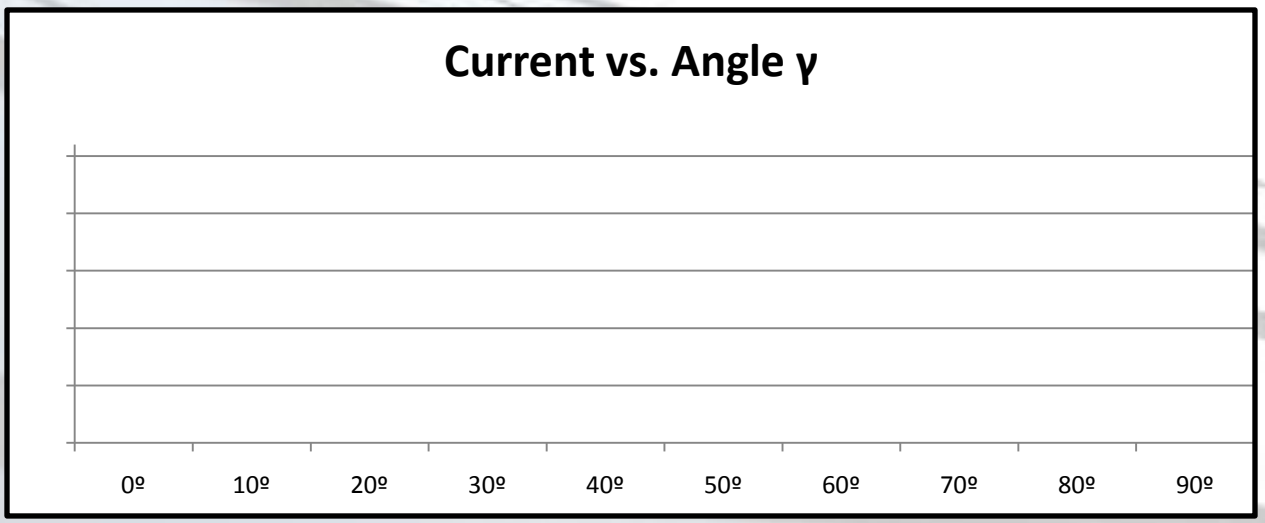
Name _____ **Date** _____

Experiment 2: Vary the Azimuth Angle of the Panel, γ:

Set the PV panel to the most efficient angle from Experiment 1. Start with the PV panel facing directly at the sun, 0º. (This should yield the highest reading.) Rotate the base and panel away from the sun, and record the current produced with the multimeter every 10º. Record the measurements in the table below.

Solar angles:	θz=	β=								
γ	**0º**	**10º**	**20º**	**30º**	**40º**	**50º**	**60º**	**70º**	**80º**	**90º**
Isc (mA)										

Plot the current measured at each angle on the graph below. Draw a curve connecting the points.



Investigating Questions

1. Describe the effect on the current of rotating the panel away from the sun.

2. If this PV panel is mounted facing south, how efficient is it just after sunrise or before sunset compared to the efficiency at noon?

3. What direction would you point your panel if you only needed to power a computer to do your homework at 4:30pm every day?

4. What could you do to increase the efficiency of the PV panel over the course of a day?