

Photovoltaic Panel Output as Angle to the Light Source is Varied

Objective:

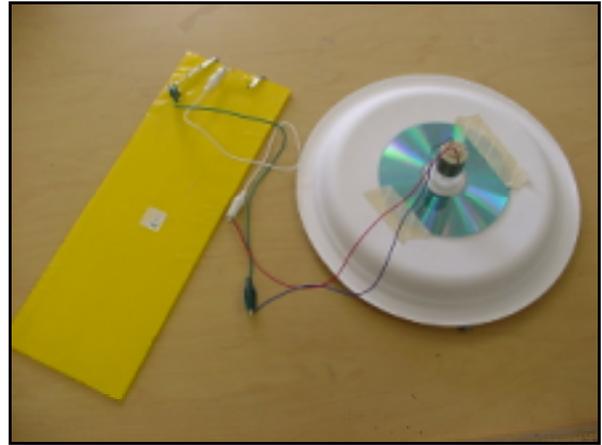
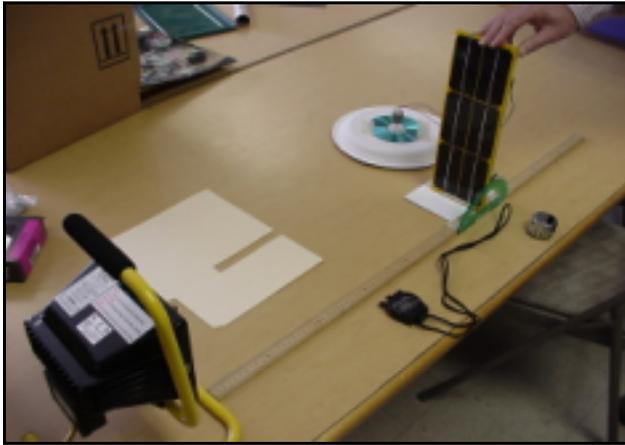
Through an investigation find out how solar electric panels behave in terms of output as they are positioned at different angle to the sun's rays or another light source.

Materials:

Photovoltaic panels	meter sticks
small motors	motor mounted counting discs
stopwatches	hand counters
protractors	500 Watt Halogen Lamps (if done inside)

Procedures:

1. Set up the apparatus as seen in the picture. Design a data chart to record the data in the procedure.



2. Use groups of 4 students with one student holding the panel at the given angle, one student on the stopwatch, and two students counting the revolutions of the motor rotator.

3. If lab is inside position the panel 60 centimeters from the lamp.

4. Attach the wires for a complete circuit. **Hold the rotating disc horizontal.** Place the panel at 90 degrees to the horizontal or 90 degrees to the rays of the sun. Make sure that fingers are not covering any part of the panel. Allow the motor some time to get up to a constant rotation speed.

5. Start the stopwatch and begin counting the revolutions of the disc. Count the number of revolutions in a 20 second period of time. Record this number in a data chart. Repeat this measurement 2 more times and enter in the data sheet.

6. Do this same procedure for other angles. You can do increments of 10 degrees or you can do 90,60,45,30, and 0 degrees.

7. Make a graph of the data. Put the number of rotations on the Y axis and the angle on the X axis.

Conclusion:

At what angle to the light source does the panel produce the most electricity?

Is the graph of the panel output compared to angle of incident light a straight line or a curve?

If the graph is a curve what does this mean in terms of angle of placement and loss of energy?